



Department of  
Design and  
Construction

PROJECT ID:

S136-383S

LAW

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 1 OF 3

# BID BOOKLET

FOR FURNISHING ALL LABOR AND MATERIALS  
NECESSARY AND REQUIRED FOR:

## DSNY District SI3 Garage and Repair Shop – HVAC System and Roof Replacement

LOCATION:  
BOROUGH:  
CITY OF NEW YORK

1000 West Service Road  
Staten Island, NY 10314

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

New York City Department of Sanitation

WSP USA Inc.



Date:

June 28, 2019

20-003



Lorraine Grillo  
Commissioner

Jamie Torres-Springer  
First Deputy Commissioner

Justin Walter  
Chief Administrative Officer  
Administration

Nicholas Mendoza  
Agency Chief Contracting Officer

Lorraine Holley  
Deputy ACCO

March 06, 2020

**CERTIFIED MAIL - RETURN RECEIPT REQUEST**  
**DELRIC CONSTRUCTION CO., INC.**  
**845 BELMONT AVENUE**  
**NORTH HALEDON, NJ 07508**

RE: FMS ID: S136-383S  
E-PIN: 85019B0092001  
DDC PIN: 8502019TR0002C  
\*PQL: (GC LARGE ) DSNY DISTRICT SI3  
GARAGE AND REPAIR SHOP-HVAC  
SYSTEM AND ROOF REPLACEMENT-  
BOROUGH OF STATEN ISLAND  
**NOTICE OF AWARD**

Dear Contractor:

You are hereby awarded the above referenced contract based upon your bid in the amount of \$22,796,793.00 submitted at the bid opening on October 29, 2019. 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 two 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 two 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



**Department of  
Design and  
Construction**

documentation specified in this paragraph is required for registration of the contract with the Comptroller's Office.

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.

**As of August 16, 2019, please be advised that Contract Site Safety Plans for DDC projects must be submitted through DDC's online Site Safety Plan (SSP) application (available via our Agency Portal – DDC Anywhere).**

To create an account and begin your Site Safety Pan submission using SSP, click on the link below:

**DDC Portal <https://ddcanywhere.nyc/Registration/Registration>**

For questions regarding this web-based application, please contact DDC via email at: [appsupport@ddc.nyc.gov](mailto:appsupport@ddc.nyc.gov).

Sincerely,

*for* Lorraine Holley  
Deputy ACCO

## **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.

## **PRE BID QUESTIONS (PBQs):**

Please be advised that PBQs should be submitted to the Agency Contact Person (CSB\_projectinquiries@ddc.nyc.gov) at least five (5) business days (by 5:00 PM EST) prior to the bid opening date as indicated in BID INFORMATION, and SCHEDULE B, VOLUME 1 OF 3 of this BID BOOKLET.

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

## **NYC Contract Financing Loan Fund**

*Loans at a 3% annual interest rate to perform on New York City contracts*

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

**Loans of up to \$500,000 at an annual interest rate of 3% are available to eligible\* businesses to perform on New York City contracts. Closing fees apply.**

\*To be eligible for a loan, you must:

- Have an operating business, AND
- Be applying for financing as a prime or sub-contractor to use toward a contract with a City agency or City-funded entity.
- Additional Eligibility requirements may also apply.

How it works:

Step 1: Fill out the Contract Financing inquiry form at [nyc.gov/contractfinancing](http://nyc.gov/contractfinancing)

Step 2: If Eligible, a participating lender will contact you within two business days.

Step 3: Begin the loan application process

For more information: Call 311 or visit [nyc.gov/contractfinancing](http://nyc.gov/contractfinancing)

**(NO FURTHER TEXT ON THIS PAGE)**

## **NYC Bond Collateral Assistance Fund**

If your business is bidding or planning to bid on a project as a prime or subcontractor with a City agency or the NYC Economic Development Corporation (NYCEDC) and the project requires surety bonding, you may be eligible\* to receive up to \$500,000 in Collateral Assistance to enhance your surety bond application from a participating bond service provider coordinated with the NYC Department of Small Business Services (SBS).

\*To be eligible, you must:

- Have an operating construction business, AND
- Be bidding or planning to bid as a prime or subcontractor on a contract with a City agency or NYCEDC that requires bonding
- Additional Eligibility requirements may apply.

How it works:

Step 1: Fill out the Bond Collateral Assistance Fund inquiry form at [nyc.gov/bondfund](http://nyc.gov/bondfund)

Step 2: If Eligible, the bond service provider will contact you within two business days

Step 3: Begin the bond application process

For more information: Call 311 or visit [nyc.gov/bondfund](http://nyc.gov/bondfund)

**(NO FURTHER TEXT ON THIS PAGE)**

**BID BOOKLET  
PART A**

PROJECT ID: S136-383S

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)
- 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 Agency Contact Person noted on Attachment 1 of this Bid Booklet.
  - (3) **PASSPort Compliance:** The Bidder is advised that Vendex Questionnaires and procedures have been replaced by the PASSPort system. Compliance with PASSPort is mandatory for contract award. PASSPort details are set forth in Part B of this Bid Booklet.
  - (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>Building Management and Control System</i> |
| Specification Section: | <i>230923</i>                                 |
| Manufacturer:          | <i>Honeywell</i>                              |
| Allowance Amount:      | <i>Not to Exceed \$233,884.00</i>             |
|                        |   |
| 2. Proprietary Item:   | <i>Fire Alarm System</i>                      |
| Specification Section: | <i>283100</i>                                 |
| Manufacturer:          | <i>Siemens</i>                                |
| Allowance Amount:      | <i>Not to Exceed \$90,315.00</i>              |

3. Proprietary Item: *Roofing*  
Specification Section: *075216*  
Manufacturer: *Siplast*  
Allowance Amount: Not to Exceed \$1,472,594.00

## SPECIAL EXPERIENCE REQUIREMENTS

Special Experience Requirements apply as indicated below.

Special Experience Requirements are not applicable to the Bidder for this contract since the Department of Design and Construction has established a pre-qualified list ("PQL") of contractors for furnishing all labor, materials and equipment, necessary and required to perform work on facilities determined by the City to be General Construction – Large Projects. This procurement for the specified work is being advertised and let solely to bidders who were previously pre-qualified based on their prior experience, and placed on the General Construction – Large Projects PQL. Bids submitted by other than such pre-qualified bidders will be rejected as non-responsive bids. The below listed Special Experience Requirements apply solely to the Contractor/Sub-contractor performing the specific area(s) of work shown and the manufacturer that will supply or fabricate specific material or equipment.

Specific Areas of Work: General Construction      X   YES           NO

(A) **SPECIAL EXPERIENCE REQUIREMENTS FOR SPECIFIC AREAS OF WORK:** The special experience requirements set forth below apply to the contractor or subcontractor that will perform specific areas of work. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of such award, the contractor will be required to submit the qualifications of the contractor or subcontractor that will perform these specific areas of work. If the bidder intends to perform these specific areas of work with its own forces, it must demonstrate compliance with the special experience requirements. If the bidder intends to subcontract these specific areas of work, its proposed subcontractor(s) must demonstrate compliance with the special experience requirements. Once approved, no substitution will be permitted, unless the qualifications of the proposed replacement have been approved in writing in advance by the City. The bidder is advised to carefully review these special experience requirements prior to submitting its bid, as such experience requirements will be strictly enforced.

- (1) Special experience requirements apply to the contractor or subcontractor that will perform specific areas of work specified in the section(s) set forth below.

General Construction

- Section 075216: Modified Bituminous Membrane Roofing

- (2) Special experience requirements apply to the contractor or subcontractor that will perform specific areas of work specified in the section(s) set forth below. Such experience requirements are set forth in full in the Addendum to the General Conditions.

a. The contractor or subcontractor performing the work of this section must be a company regularly engaged in performing roofing projects with its own workforce and have successfully completed in a timely fashion at least three (3) roofing projects similar in scope, size and type to the required work within the last three (3) consecutive years prior to the bid opening. At least one of those projects must have been performed within the last twelve (12) months. The three (3) qualifying projects must have utilized the Siplast roof system, been installed by the contractor's or subcontractor's company utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by Siplast. In addition, the contractor or subcontractor must be a certified or authorized installer for the Siplast roof system specified herein and shall submit proof of same.

- (3) For each project submitted to demonstrate compliance with the special experience requirements for specific areas of work, the contractor or proposed subcontractor will be required to complete the Qualification Form included in the Bid Booklet.

a. The City will only evaluate a project if the following criteria are met: (1) the project is described on the Qualification Form, and (2) all information on the Qualification Form is provided. The City will not evaluate any project which does not comply with the criteria set forth herein, including any project which is referred to only on the resume of an individual.

b. The contractor or subcontractor must specify, for each qualifying project submitted, the type of roofing system utilized and provide proof that the manufacturer's warranty for that project was issued. The City will only evaluate a project if the following criteria are met: (1) the project is described on the Qualification Form, and (2) all information required to be provided by the contractor or subcontractor on the Qualification Form is actually provided. The City will not evaluate any project which does not comply with the criteria set forth herein, including any project which is referred to only on the resume of an individual.

**Qualification Form**

Project ID: S136-383S

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:     N/A    

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: \_\_\_\_\_

**Qualification Form**

Project ID: S136-383S

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:   N/A  

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: \_\_\_\_\_

## Qualification Form

Project ID: S136-383S

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: N/A

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: \_\_\_\_\_

## 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.

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 1, Part A, below, sets forth provisions related to the participation goals for construction, standard and professional services contracts. Article 1, 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 [zhangji@ddc.nyc.gov](mailto:zhangji@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.

Tax ID #: 22-2111028

APT E-  
PIN#: 85019B0092

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 # 85019B0092 FMS Project ID#: S136-383S  
 Project Title/Agency DSNY District SI3 Garage and Repair Shop – HVAC System and Roof Replacement  
 PIN # 8502019TR0002C  
 Bid/Proposal  
 Response Date: October 25, 2019  
 Contracting Agency Department of Design and Construction  
 Agency Address 30-30 Thomson Avenue City Long Island City State NY Zip Code 11101  
 Contact Person Nichole John-Baptiste Title MWBE Liaison & Compliance Analyst  
 Telephone # (718) 391-2530 Email Ifilini@ddc.nyc.gov

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

This project consists of a roof and HVAC system replacement at the DSNY SI3 garage. As a result of the HVAC upgrades, a new electrical service will be required and installed, accompanied by a new photovoltaic system at the roof to be integrated into the primary electrical system.

#### 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>34 %</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>34 %</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.

Tax ID #: 22-2111028

APT E-  
PIN#: 85019B0092

**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>22-2111028</u>	FMS Vendor ID #	
Business Name	<u>Delric Construction Co., Inc.</u>	Contact Person	<u>Anthony Della Cerra</u>
Address	<u>845 Belmont Avenue, North Haledon, New Jersey 07508</u>		
Telephone #	<u>973-427-0058</u>	Email	<u>adellacerra@delricconstruction.com</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.	Total Bid/Proposal Value		Agency Total Participation Goals (Line 1, Page 6)		Calculated M/WBE Participation Amount
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.					
	\$ 22,796,793.	X	34%	=	\$ 7,750,910. 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.	Total Bid/Proposal Value		Adjusted Participation Goal (From Partial Waiver)		Calculated M/WBE Participation Amount
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.					
	\$	X		=	\$ Line 3

Tax ID #: 22-2111028

APTE- PIN#: 85019B0092

**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? % 50 *Ac 11/31/19*

*Enter bid description of the type of work to be performed for all any services you perform or subcontracted to other M/WBE firms. Enter the contract dollar value of the work subcontracted to M/WBE and the dollar value of the work subcontracted to non-M/WBE firms. Use the format shown below.*

1	Roofing	\$2,213,500	M/WBE	4/1/20 - 8/1/20
2	Sanitation	\$1,765,000	Non-M/WBE	1/1/20 - 6/1/20
3	WAC	\$1,100,000	MBE	1/1/20 - 12/1/20
4	Plumbing	\$1,000,000	Non-M/WBE	1/1/20 - 10/1/20
5	Electric	\$1,000,000	Non-M/WBE	1/1/20 - 1/1/20
6	Solar	\$1,100,000	M/WBE	8/1/20 - 12/1/20
7	Electric Subcontract	\$1,000,000	M/WBE	1/1/20 - 12/1/20
8	Roofing Subcontract	\$1,765,000	M/WBE	8/1/20 - 12/1/20
9	Plumbing Subcontract	\$1,000,000	M/WBE	2/1/20 - 8/8/20
10	Controls	\$850,000	M/WBE	1/1/20 - 12/1/20
11	Painters	\$500,000	M/WBE	1/1/20 - 8/21/20
12	Security	\$1,000,000	M/WBE	1/1/20 - 12/1/20
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 *[Signature]* Date Nov. 13, 2019  
 Print Name Anthony Della Cerra Title Vice President

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.)

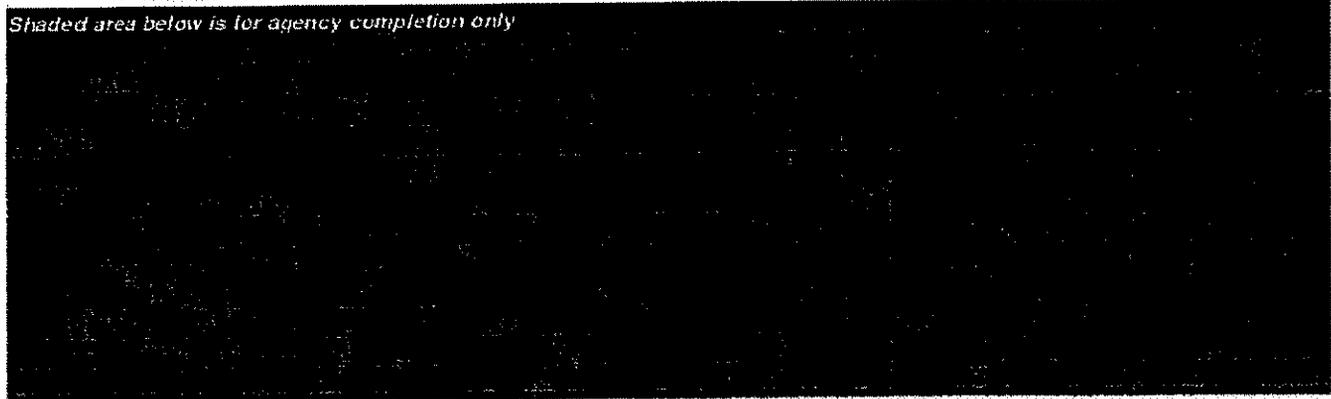
<b>TYPE OF Contract</b>	<b>ENTITY</b>	<b>DATE COMPLETED</b>
Manager at entity that hired vendor (Name/Phone No./Email)		
<b>Total Contract Amount \$</b>	<b>Total Amount Subcontracted \$</b>	
<b>Type of Work Subcontracted</b>		

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

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

**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:** Anthony Della Cerra      **Date:** October 25, 2019  
**Print Name:** Anthony Della Cerra      **Title:** Vice President



**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: S136-383S**

**DSNY SI District 3 Garage 7 Repair Shop HVAC System & Roof  
Replacement  
1000 West Service Road  
Staten island, NY 10314**

Name of Bidder: Delric Construction Co., Inc.

Date of Bid Opening: October 25, 2019

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

Place of Business of Bidder: 845 Belmont Avenue, North Haledon, New Jersey 07508

Bidder's Telephone Number: 973-427-0058      Bidder's Fax Number: 973-427-0377

Bidder's Email Address: adellacerra@delricconstruction.com

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 Jersey

Name and Home Address of President: Robert Ricciardi  
68 Lake Drive West, Wayne, NJ 07470

Name and Home Address of Secretary: Anthony Della Cerra  
507 Squaw Brook Rd., North Haledon, NJ 07508

Name and Home Address of Treasurer: \_\_\_\_\_  
Robert Ricciardi  
68 Lake Drive West, Wayne, NJ 07470

## BID FORM

Delric Construction 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 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 firms.

**BID FORM**

Delric Construction Co., Inc.

**PROJECT ID: S136-383S**

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) and (C) set forth below. Total Price shall include all costs and expenses, i.e., labor and material, including overhead and profit for all the Work, described below and shown in the drawings and specifications.

Total Price For Labor

Total Price for Material Sold and Delivered

\$ 6,295,500 +

\$ 14,689,500

Total Price for Item A= \$ 20,985,000

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

\$15,000.00

- C. AMOUNT for Proprietary Items (pages 2a)

\$1,796,793.00

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

\$22,796,793

*BR* 10/29/19

**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: Delric Construction Co., Inc.

By:

*R. Ricciardi*

Robert Ricciardi

(Signature of Partner or corporate officer)

*Anthony Della Cerra*

Attest: Anthony Della Cerra  
(Corporate Seal)

Secretary of Corporate Bidder

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 <sup>Jersey</sup> YORK, COUNTY OF Passaic ss:

Robert Ricciardi

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

I am the President of the above named corporation whose name is subscribed to and which executed the foregoing bid. I reside at 68 Lake Drive West, Wayne, New Jersey 07470

I have knowledge of the several matters therein stated, and they are in all respects true.

R. Ricciardi  
(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this  
25th day of October, 2019

Marguerite Wemken  
Notary Public  
MARGUERITE WEMKEN  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES JULY 27, 2022

**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: Delric Construction Co., Inc.  
Address: 845 Belmont Avenue  
City: North Haledon State: New Jersey Zip Code: 07508

**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  
  
22-211028  
-----

By:   
Signature: Anthony Della Cerra  
  
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

## 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: S136-383S

**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:

Par Plumbing  
(Print Name)

As per Plans & Specs  
\_\_\_\_\_  
\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$ 796,555

2. **HVAC CONTRACTOR:**

Description of HVAC Work:

Rams Mechanical  
(Print Name)

As per Plans & Specs  
\_\_\_\_\_  
\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$3,915,000

3. **ELECTRICAL CONTRACTOR:**

Description of Electrical Work:

Truval Electric  
(Print Name)

As per Plans & Specs  
\_\_\_\_\_  
\_\_\_\_\_

Agreed amount to be paid Subcontractor: \$3,500,000

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

  
(Bidder's Signature)

Anthony Della Cerra  
(Print Name)

845 Belmont Avenue, North Haledon, New Jersey 07508  
(Address)

Vice P(resident)  
(Title)

973-427-0058  
(Phone #)

973-427-0377  
(Fax#)

October 25, 2019  
(Date)

BID BOND 1  
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, Delric Construction Co., Inc.

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

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 \_\_\_\_\_

DSNY District S13 Garage & Repair Shop

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 21st day of October, 2019.

(Seal)

Delric Construction Co., Inc. (L.S.)

Principal

By:



(Seal)

Liberty Mutual Insurance Company

Surety

By:

Thomas J. Henn, Attorney-In-Fact

BID BOND 3

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of NEW JERSEY County of PASSAIC ss:  
On this 25<sup>TH</sup> day of OCTOBER, 2019, before me personally came  
ANTHONY DELLA CERRA to me known, who, being by me duly sworn, did depose and say that he  
resides at 507 SQUAW BROOK RD. NORTH Haledon, NJ 07508  
that he is the VICE PRESIDENT of DETRIC CONSTRUCTION Co., INC  
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.

Marguerite Wemken  
Notary Public

MARGUERITE WEMKEN  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES JULY 27, 2022

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

## 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.



CONTRACTOR'S BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S

Sponsor Agency: DSNY

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
	<b>CONTRACT 1 - GENERAL CONSTRUCTION WORK</b>							
01 0000	<b>GENERAL REQUIREMENTS</b>							
01 0000	<b>GENERAL REQUIREMENTS</b>							
	Temporary trailer, incl equip., heat, etc.	1	ea					
	Temporary trailer, DDC	1	ea					
	Temporary Heat	1	ls					
	Mobilization	1	ls					
	<b>Subtotal</b>							\$3,824,000
02 0000	<b>EXISTING CONDITIONS</b>							
02 4191	<b>SELECTIVE DEMOLITION, REMOVALS, AND SALVAGE</b>							
	<b>Interior Demolition</b>							
	Remove existing GWB ceiling assembly in tel room at 1st floor	49	sf					
	Remove ACT ceiling in tel room	960	sf					
	Remove ACT ceiling in locker room at 2nd floor	1,380	sf					
	Remove partition in phone room	600	sf					
	Remove single doors in phone room	3	ea					
	Remove part of floor slab in vestibule	21	sf					
	Remove existing concrete pad in boiler room and repair floor after demo	70	sf					
	Remove 4' x 3' existing window	1	ea					
	Temporary protection, signage, etc	1	ls					
	Excavate to remove electrical concrete encasement	20	lf					
	Remove existing manhole	1	ea					
	Replace concrete flags at sidewalk overflow drain locations (48" x 48")	300	flags sf					
	<b>Subtotal</b>							\$250,000



CONTRACTORS BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S

Sponsor Agency: DSNY

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
02 8213	<b>ASBESTOS ABATEMENT</b>							
	Roof Flashing/Tar Black	1,800	sf					
	Parapet wall covering /membrane Black	2,000	sf					
	Skylight flashing/tar Black	50	sf					
	AC Dunnage flashing/tar Black	10	sf					
	Heat Exchange unit flashing/tar Black	50	sf					
	Pitch pocket sealant/tar Black	5	sf					
	Make up Air unit pitch pocket sealant/tar Black	2	sf					
	Roof drain flashing/tar Black	25	sf					
	Exhaust fan flashing/tar Black	200	sf					
	Vent/Flue flashing/tar Black	10	sf					
	Make-up Air unit flashing/tar Black	25	sf					
	Roof Flashing/Tar Gray	40	sf					
	AC Unit flashing/tar Black	80	sf					
	Condenser Dunnage flashing/tar Black	10	sf					
	Gooseneck exhaust flashing/tar	20	sf					
	WE/TE Exhaust flashing/tar Black	96	sf					
	Decontamination unit assumed	4	ea					
	<b>Subtotal</b>							\$700,000
03 0000	<b>CONCRETE</b>							
03 0130	<b>CONCRETE RESTORATION</b>							
	Patch/Repair concrete floor after removed concrete pads and walls	21	sf					
	<b>Subtotal</b>							\$25,000
03 3000	<b>CAST-IN-PLACE CONCRETE</b>							
	New concrete floor slab in vestibule on 1st floor as per det 8/A102	21	sf					
	New 4" concrete pads in boiler and electrical rooms	95	sf					
	<b>Subtotal</b>							\$25,000



Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delfic Construction Co., Inc.

DDC ID: S136-383S  
 Sponsor Agency: DSNY

CONTRACTOR'S BID BREAKDOWN FORM

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
04 0000	MASONRY							
04 2200	CONCRETE UNIT MASONRY New CMU wall in electrical room	220	sf					
	At damaged / loose exterior masonry; remove and replace damaged / loose masonry	4	sf					
	Remove and replace existing CMU to install 4x4x14 steel stub for damage and canopy installation as per det 9.11/A503	1	loc					
	Provide opening in masonry wall for down spout installation	4	loc					
	Minor repairs at removed window		loc					
	Subtotal							\$40,000
05 0000	METAL							
05 1000	STRUCTURAL STEEL							
	Cut existing roof metal deck to provide openings for steel posts installation	21	loc					
	Reinforcement steel posts as per det on page S001	21	loc					
	Roof dunnage for mech equipment	33	ton					
	Roof canopy as per Details 6.7.8.9/A503 Drawing (incl. HSS 6x6 Canopy posts, C 5x9 Canopy, cantilever and Beam, HSS 12x6 Beam, HSS 4x4x1/2 Stabilizer)	3	ton					
	C purlins bolted to steel	21	# loc					
	Canopy metal deck	100	sf					
	L4x4x1/4 Metal frame to close up opening at mech equipment demolition as per det Page S001 included met deck (M101.102)	21	loc					
	Wall mounted inverters for photovoltaic panels	1	ls					
	Subtotal							\$1,300,000



**Department of  
Design and  
Construction**

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delfic Construction Co., Inc.

DDC ID: S136-3835

Sponsor Agency: DSNY

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
05 3000	<b>METAL DECKING</b> Remove corroded deck and replace with new as per det A/S100 Note C	11,000	sf					
	Long span joists light corrosion. Wire brush cleaned corroded areas to bar steel Note WCPJ S100	308	lf					
	Steel beam light to medium corrosion Note S S100 Wire brush cleaned corroded areas	17	lf in above					
	Subtotal							\$390,000
06 0000	<b>CARPENTRY</b>							
06 1000	<b>ROUGH CARPENTRY (included w/ 075216)</b>							
07 0000	<b>THERMAL AND MOISTURE PROTECTION</b>							
07 1050.19	<b>PREPARATION FOR REROOFING (included w/ 075216)</b>							
07 2100	<b>INSULATION (included w/ 075216)</b>							
07 5216	<b>MODIFIED BITUMINOUS MEMBRANE ROOFING</b>							
	Remove exisg roof system including flashing, cant strip and insulation down to roof deck	75,000	sf					
	Temporary protection to roof	75,000	sf					
	New SBS modified roof system	75,000	sf					
	Replace 2 courses concrete block at parapet wall for flashing work	422	lf					
	Replace metal coping at parapet on roof #2 as per det 4/A502	4,222	lf					
	Replace metal gravel stop & wood blocking at roof #1 as per det 7/A502	500	lf					
	Flexible vapor retarder with compressible insulation	In above	sf					
	Flashing at median building walls	400	lf					
	Flashing at pipe penetrations	50	loc					



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Deltec Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION  
 DDC ID: S136-383S  
 Sponsor Agency: DSNY

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
	Unobstructed 6'x6' rooftop access locations and landings for FDNY 90ea	3,240	sf					
	New Roof curb	1	ea					
	Prime and waterproof coating parapet wall at North part of roof	500	sf					
	Roof mounted canopy	1	loc					
	Remove & replace skylight: 5'-4" x 17'-6" as per det 5/A503	1	ea					
	Provide new openings for mech penetration as per drawing	21	loc					
	Canopy roof gutter	100	lf					
	Expansion joints	In above	lf					
	Clear path 6' wide for FDNY, walkway pads	In above	sf					
	Subtotal							\$2,300,000
07 6200	SHEET METAL FLASHING AND TRIM (included w/ 075216)							
07 7100	ROOF SPECIAL TIES (included w/ 075216)							
07 8100	SPRAYED FIRE RESISTIVE MATERIALS (included w/ 075216)							
07 9200	JOINT SEALANTS (included w/ 075216)							
08 0000	OPENINGS							
08 1113	HOLLOW METAL DOORS AND FRAMES							
	3'-0" x 7'-0" HM Door, Frame, hardware	3	ea					
	Premium for 90min fire rating	3	ea					
	Premium for 2'-0"x1'-0" door louver	3	ea					
	Premium for glass vision panel	3	ea					
	Subtotal							\$20,000
08 6400	SKYLIGHT							
	Remove & replace skylight: 5'-4" x 17'-6" as per det 5/A503	1	ea					
	Subtotal							\$50,000



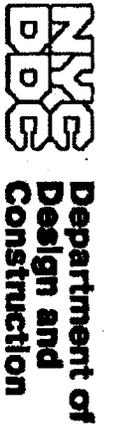
Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S  
 Sponsor Agency: DSNY

CONTRACT 1 - GENERAL CONSTRUCTION

CONTRACTOR'S BID BREAKDOWN FORM

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
08 7100	DOOR HARDWARE (included w/ 081113)							
09 0000	FINISHES							
09 2900	GYPSUM BOARD							
	New GWB Ceiling in electric room on 1 st floor	49	sf					
	Subtotal							\$20,000.
09 5100	ACOUSTICAL CEILINGS							
	New ACT ceiling as per Det 3/A103 in electrical room 1st floor and locker room on 2nd floor	2,340	sf					
	Subtotal							\$30,000.
09 6513	RESILIENT BASE (included w/ other Div 9 sections)							
09 6519	RESILIENT TILE FLOORING							
	VCT Floor tile in vestibule on 1st floor	70	sf					
	Vinyl base at new VCT flooring in vestibule	20	lf					
	Subtotal							\$8,000.
09 9113	EXTERIOR PAINTING (included w/ other Div 9 sections)							
09 9123	INTERIOR PAINTING							
	At Light Corrosion on Metal Deck & Steel Joist; wire brush clean and repaint	200	sf					
	At Light Corrosion on Steel Beam / Joist; wire brush clean and repaint	308	lf					
	Paint Doors	3	ea					
	Paint GWB Ceiling	272	sf					
	Subtotal							\$30,000.



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION  
 DDC ID: S136-383S  
 Sponsor Agency: DSNY

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
09 9656	SLIP RETARDANT EPOXY FLOOR COATING	272	sf					\$5,000.
	Epoxy coating on existing concrete floor at electric room 1st floor							
	Subtotal							
10 0000	SPECIALTIES							
10 7300	PROTECTIVE COVERS (included w/ 263 100)							
21 0000	FIRE SUPPRESSION SLEEVES AND SEALS FOR FIRE SUPPRESSION PIPING							
21 0517	Cutting / Patching and fire stopping	1	ls					
	Demolition							
	Disconnect and remove existing sprinkler heads with related piping	775	ea					
	Disconnect and remove existing branch piping (wet system & dry system)	2,325	lf					
	Remove existing insulation on fire standpipe piping	545	lf					
	New							
	Commissioning	1	ls					
	Tests and integrated system	1	system					
	Hydrant flow test	1	ea					
	Non-destructive testing of extg sprinkler & fire standpipe mains	1	system					
	Subtotal							\$50,000.
21 0518	ESCUTCHEONS FOR FIRE SUPPRESSION PIPING (included w/ other Div 21 sections)							
21 0520	PIPING AND FITTING MATERIALS (included w/ other Div 21 sections)							



Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-363S  
 Sponsor Agency: DSNY

CONTRACT 1 - GENERAL CONSTRUCTION

CONTRACTOR'S BID BREAKDOWN FORM

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
21 0523	FIRE SUPPRESSION VALVES (Included w/ other Div 21 sections)							
21 0529	HANGERS, SUPPORTS, ANCHORS AND GUIDES FOR FIRE SUPPRESSION SYSTEMS (Included w/ other Div 21 sections)							
21 0553	IDENTIFICATION OF FIRE SUPPRESSION PIPING AND EQUIPMENT	1	system					\$25,000.
	System ID							
	Subtotal							\$25,000.
21 0719	INSULATION							
	Insulation main piping	545	#					\$26,000.
	Subtotal							\$26,000.
21 0750	ELECTRIC HEAT TRACING							
	Heat tracing	1	-# ls					\$10,000.
	Subtotal							\$10,000.
21 1200	STANDPIPE AND HOSE SYSTEMS							
	Standpipe and Hose Systems	1	ls					\$10,000.
	Subtotal							\$10,000.
21 1313	WET PIPE SPRINKLER SYSTEMS							
	Piping steel black treated schedule 40:	200	#					
	1" dia & 1 1/4" dia Pipe / fittings / supports	1	ea					
	Te-in	1	ls					
	Misc valves and specialties	3	ea					
	Replace roof manifold							

Project: DSNY District S13 Garage and Repair Shop -- HVAC System and Roof Replacement  
Location: 1000 West Service Road, Staten Island, NY 10314  
Bidder: Detric Construction Co., Inc.

DDC ID: S136-383S  
Sponsor Agency: DSNY

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
	Pendant, Upright & Sidewall Sprinkler Head	1	ea					
	Flow switch	1	ea					
	Replace inspection test assemblies	1	ea					
	Connections to existing system (remove temporary piping and connections)	1	system					
	Subtotal							\$400,000.
21 1316	<b>DRY PIPE SPRINKLER SYSTEMS</b>							
	Piping steel black treated schedule 40:							
	1" dia & 1 1/4" dia Pipe / fittings / supports	300	H					
	Pendant, Upright & Sidewall Sprinkler Head - dry	500	ea					
	Tie-in	1	ea					
	Flow switch	1	ea					
	Misc valves and specialties	1	system					
	Subtotal							\$100,000.
22 0000	<b>PLUMBING</b>							
22 0517	<b>SLEEVES AND SEALS FOR PLUMBING PIPING (Included w/ 220529)</b>							
22 0529	<b>HANGERS, SUPPORTS, ANCHORS AND GUIDES AND SEISMIC RESTRAINT</b>							
	Demolition:							
	Disconnect and remove existing roof flashing from the existing sanitary vent stack penetrations thru the roof	9	ea					
	Disconnect and remove existing roof flashing and flashing collar from the existing roof drains	16	ea					
	Disconnect, remove and cap existing vertical piping VTR 4" dia	16	ea					



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-3835  
 Sponsor Agency: DSNY

CONTRACTOR'S BID BREAKDOWN FORM

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
	Disconnect and remove existing piping from the existing roof drain	15	ea					
	Disconnect and remove existing roof drains	16	ea					
	Tie-out		ea					
	Clear-up/ debris removal/handling/stock pile		ls					
	Chopping / patching / fire sealing		ls					
	Coordination, rentals, small tools, site specific requirements		hrs					
	New:							
	Misc. plumbing requirements		ls					
	Fire stopping and sleeves	5	ls					\$44,000
	Subtotal							
22 0533	HEAT TRACING FOR PLUMBING PIPING (Included w/ 220529)							
22 0563	IDENTIFICATION OF PLUMBING PIPING AND EQUIPMENT							
	Valve tags, charts, identification, painting	1	ls					\$29,000
	Subtotal							
22 0590	TESTING							
	Test Roof Drains (Before And After Installation)	28	ea					
	Flushing, cleaning piping (including existing system)	1	system					\$23,000
	Subtotal							
22 0719	INSULATION (included w/ 221413)							
22 0800	COMMISSIONING OF PLUMBING (included w/ other Div 22 sections)							



**Department of  
Design and  
Construction**

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNV District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-3835

Sponsor Agency: DSNV

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 1413	<b>STORM DRAIN PIPING AND FITTING MATERIALS</b>							
	Domestic water piping	30	lf					
	1" dia pipe/ fittings / supports	1	ea					
	RPZ 1" dia	1	ea					
	Cap 1" dia	1	ea					
	Tie-in to existing system	1	ea					
	Insulation piping	30	lf					
	Sanitary waste and vent and storm piping fitting material:							
	10" dia pipe/ fittings / supports	410	10"					
	8" dia pipe/ fittings / supports	480	8"					
	6" dia pipe/ fittings / supports	180	6"					
	4" dia pipe/ fittings / supports	410	4"					
	Tie-in to existing system	23	ea					
	Painting piping	exclude	lf					
	Insulation horizontal piping	1,300	lf					
	Sanitary waste and vent and storm piping specialties:							
	Roof flashing at the original vent stack location with new flashing, compatible with the new roof replacement selection	exclude	ea					
	Roof flashing and flashing collar at each roof drain location, this will be typical for all primary roof drains and new secondary roof drains	Exclude Flashing 28 Collars	ea					
	Primary roof drain 6" dia	14	ea					
	Secondary roof drain 6" dia	14	ea					
	Overflow roof drain, to exterior drain spout	4	ea					
	Clean-out	6	ea					
	Clean up existing leaders	6	ea					
	<b>Subtotal</b>							\$779,000.
22 1423	<b>STORM DRAINAGE SPECIALTIES (included w/ 221413)</b>							



Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

CONTRACTORS BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION  
 DDC ID: S136-3835  
 Sponsor Agency: DSNY

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 1601	NATURAL GAS SYSTEM							
	4" dia pipe/fittings / supports	60'	lf					
	Shut-off valve 4" dia	1	ea					
	Tie-in	1	ea					
	Boiler connection	2	ea					
	Misc valves and specialties	5	ls					
	Coal piping	exclude	lf					
	Subtotal							\$138,000.
23 0000	HEATING, VENTILATING AND AIR CONDITIONING (HVAC)							
23 0005	ACCESS DOORS IN GENERAL CONSTRUCTION (Included w/ 230529)							
23 0200	FIRESTOPPING							
	Demolition - Remedial Work:							
	Disconnect and remove existing air cooled chiller 24 Ton with related piping	1	unit					
	Disconnect and remove AC air cooled split units with related piping	4	ea					
	Disconnect and remove ACCU air cooled split units with related piping	1	ea					
	Disconnect and remove 20000 cfm, 50 Ton rooftop air handling unit with related piping and ductwork	2	rtu					
	Disconnect and remove existing HV heating & ventilation units 3000 cfm with related piping, duct and control (mounted indoor) - by drawing M-101.00	1	ea					
	Disconnect and remove existing HV heating & ventilation units 19000 cfm with related piping, duct and control (mounted indoor) - by drawing M-101.00	1	ea					



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION

DDC ID: S136-383S  
 Sponsor Agency: DSNY

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
	Disconnect and remove existing HV heating & ventilation units 1200 cfm with related piping, duct and control (mounted indoor) - by drawing M-101.00	1	ea					
	Disconnect and remove existing make-up units (mounted on the roof)	3	ea					
	Disconnect and remove existing chilled water pumps with related piping	2	ea					
	Disconnect and remove existing ductwork with related air devices and dampers	5,000	lbs					
	Disconnect and remove existing air devices	30	ea					
	Disconnect and remove existing piping - hot water and chilled water	80	lf					
	Disconnect and remove existing exhaust fans	29	ea					
	Disconnect and remove existing exhaust fans - inline	3	ea					
	Disconnect and remove existing unit heaters with related piping	7	ea					
	Disconnect and remove existing unit heaters with related piping	10	ea					
	Disconnect and remove existing expansion tank with related piping	1	ea					
	Disconnect and remove existing air separator with related piping	1	ea					
	Misc demolition requirements (including PE, WE-1 and etc)	1	ls					
	Hoisting and setting of air handler	1	job					
	Misc equipment requirements	1	ls					
	Chopping, patching, fire sealing	1	ls					
	<b>Subtotal</b>							\$345,000.
23 0513	<b>ELECTRIC MOTORS (included w/ 235210)</b>							
	<b>Subtotal</b>							



CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S  
 Sponsor Agency: DSNY

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 0516	EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING (included w/ 236210)							
23 0517	SLEEVES AND SEALS FOR HVAC PIPING (included w/ 230529)							
23 0519	METERS AND GAUGES FOR HVAC PIPING AND DUCTWORK (included w/ 235210)							
23 0523	VALVES (included w/ 235210)							
23 0529	HANGERS, ANCHORS AND SUPPORTS (included w/ other Div 23 sections)							
23 0540	ACOUSTICS							
	Sound absorber	1	effn ls					\$115,000.
	Subtotal							\$115,000.
23 0548	VIBRATION ISOLATION							
	Vibrator Control	1	ls					\$140,000.
	Subtotal							\$140,000.
23 0553	SYSTEMS IDENTIFICATION							
	Valve tags, charts, identification, painting	1	ls					\$11,000.
	Subtotal							\$11,000.
23 0593	TESTING, ADJUSTING AND BALANCING							
	Air & water test and balance adjustments and reports	1	bidg					
	Water balance tests and reports	1	bidg					
	Protection - egress / Ingress	1	ls					



Project: DSNV District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-3835  
 Sponsor Agency: DSNV

CONTRACTOR'S BID BREAKDOWN FORM

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
	Start-up, instructions, site specific requirements	1	ls					\$10,000.
	Subtotal							
23 0700	<b>INSULATION</b>							
	Insulation hot water piping	1,800	lf					
	Duct insulation	9,500	sf					
	Boiler insulation	2	ea					
	Subtotal							\$58,000.
23 0800	<b>COMMISSIONING OF HVAC (included w/ 236220)</b>							
23 0900	<b>INSTRUMENTS</b>							
	Miscellaneous control work requirements	1	ls					
	Calibration, Testing, sequence & Training Temperature control system	1	ls					
	Subtotal							\$230,000.
23 0923	<b>BUILDING MANAGEMENT AND CONTROL SYSTEM (BMCS)</b>							
	Chiller	1	ea					
	Boiler	2	ea					
	Pumps	8	ea					
	ERU & RTU, MU	9	units					
	HV	3	units					
	AC	2	units					
	H.O.A. & disconnect and safety switches	15	ea					
	CHW-HX-1 heat exchanger	1	ea					
	Exhaust fans	32	ea					
	Motorized dampers	12	ea					
	Smoke detection	1	ls					
	Carbon monoxide sensors	15	ea					



**Department of  
Design and  
Construction**

CONTRACTOR'S BID BREAKDOWN FORM

**CONTRACT 1 - GENERAL CONSTRUCTION**

Project: DSNV District S13 Garage and Repair Shop -- HVAC System and Roof Replacement  
Location: 1000 West Service Road, Staten Island, NY 10314  
Bidder: Delric Construction Co., Inc.

DDC ID: S136-3835  
Sponsor Agency: DSNV

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
	Carbon monoxide detection system	2	ea					
	Unit heater with unit mounted thermostat	18	ea					
	BACnet interface panel	4	ea					
	Control / low voltage wiring	1	ls					
	Misc. control requirements - including interface with existing system	1	ls					
	<b>Subtotal</b>							\$20,000.
<b>23 1113</b>	<b>SHEET METAL, DUCTWORK AND ACCESSORIES</b>							
	Galv. Steel duct	14,500	lbs					
	Flexible connection	1	ls					
	Goose neck	4	ea					
	Roof curb 20x20x12	2	ea					
	Roof curb 8x8x12	1	ea					
	Roof curb 10x10x12	1	ea					
	Roof curb 17.5x17.5x12	2	ea					
	Roof curb 32.5x32.5x12	1	ea					
	Roof curb 38.5x38.5x12	1	ea					
	Roof curb 44.5x44.5x12	1	ea					
	Roof curb 15.5x15.5x12	1	ea					
	Roof curb 24.5x24.4x12	1	ea					
	Flue 9" dia	50	lf					
	Cap 9" dia (stainless steel)	1	loc					
	Miscellaneous duct, duct accessories, air filters, etc.	1	ls					
	<b>Subtotal</b>							\$460,000.
<b>23 2123</b>	<b>PUMPS</b>							
	HWP-4, HWP-5 hot water pump 220 gpm, 10 hp	2	ea					
	CHWP-1, CHP-2 chilled water pump 102 gpm, 5 hp - per Drawing M-800	2	ea					
	<b>Subtotal</b>							\$144,000.



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION  
 DDC ID: S136-3835  
 Sponsor Agency: DSNY

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 2500	PIPE CLEANING AND CHEMICAL WATER TREATMENT							
	Cleaning, flushing & testing piping	1	ls					\$22,000.
	Subtotal							
23 2600	WATER SPECIALTIES (included w/ other Div 23 sections)							
23 3313	DAMPERS							
	Motorized dampers	12	ea					
	Misc. Fire smoke damper & access door	1	ls					\$17,000.
	Subtotal							
23 3320	DUCT CLEANING							
	Clean ductwork	1	bidg					\$40,000.
	Subtotal							
23 3610	AIR OUTLETS AND INLETS							
	Air devices	15	ea					\$2,000.
	Subtotal							
23 5100	VENTS, STACKS AND BREECING (included w/ 231113)							
23 5210	PIPING AND ACCESSORIES							
	Piping 5" pipe / fittings / supports	240	lf					
	Piping 4" pipe / fittings / supports	150	lf					
	Piping 2 1/2" pipe / fittings / supports	300	lf					
	Piping 4" pipe / fittings / supports - boiler	30	lf					
	Piping 2" pipe / fittings / supports - to MU-1 - connection only	1	unit					
	Piping 2 1/2" pipe / fittings / supports - to MU-2 - connection only	1	unit					
	Piping 2 1/2" pipe / fittings / supports - to RTU-1	100	lf					
	Piping 1 1/4" pipe / fittings / supports - MU-3	40	lf					



**Department of  
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CONTRACTORS: B/D BREAKDOWN FORM

**CONTRACT 1 - GENERAL CONSTRUCTION**

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Deltec Construction Co., Inc.

DDC ID: S136-3835

Sponsor Agency: DSNY

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
	Piping 2 1/2" pipe / fittings / supports - to MU-4	150	lf					
	Piping 2 1/2" pipe / fittings / supports - to ERU-3	150	lf					
	Piping 1" pipe / fittings / supports - ERU-4	40	lf					
	Piping 2 1/2" pipe / fittings / supports - to ERU-1, ERU-2 - connection only	2	unit					
	Tie-in	240	ea					
	Piping 1" pipe / fittings / supports/ valves - connection to UH	14	ea					
	Piping 1" pipe / fittings / supports/ valves - connection to HV-1, 2, 3	3	ea					
	Chilled water:							
	Piping 3" pipe / fittings / supports	150	lf					
	Piping 2 1/2" pipe / fittings / supports	150	lf					
	Piping 1" and smaller pipe / fittings / supports	100	lf					
	1 1/2" capped and valved connection	20	ea					
	Pipe / fittings / supports connection to chiller	1	ls					
	Misc. valves and specialties	1	ls					
	Equipment connections	1	ls					
	Subtotal							\$780,000
	<b>PACKAGED WATER TUBE BOILERS</b>							
23 5235	B-3, B-4 Gas fired boiler PBN-2500, gas 250 cfm, 150 hp, 2500 mbh	3	ea					
	Subtotal							\$104,000
	<b>REFRIGERATION MACHINES (AIR COOLED)</b>							
23 5510	CH-1 Air cooled Packaged Chiller, evaporator 42.9 ton, 108 gpm, condenser 30500 cfm, (3) fans	1	ea					
	Subtotal							\$345,000



**Department of  
Design and  
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CONTRACTOR'S BID BREAKDOWN FORM

**CONTRACT 1 - GENERAL CONSTRUCTION**

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
Location: 1000 West Service Road, Staten Island, NY 10314  
Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S  
Sponsor Agency: DSNY

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 5700	<b>HEAT EXCHANGERS</b> CHWHX-1 heat exchanger cold water 108 gpm, 511 mbh, hot water 102 gpm, 511 mbh	1	ea					
	<b>Subtotal</b>							\$12,000.
23 6220	<b>ROOFTOP PACKAGE HEATING AND COOLING UNITS</b> ERU-1/ RTU - maintenance- 22000 CFM, DX cooling 778 mbh, heating coil 1618 mbh, (2) fan 20 hp, (2) fans 15 hp, condensing unit 812 mbh, 70 ton ERU-2/ RTU - maintenance- 22000 CFM, DX cooling 778 mbh, heating coil 1618 mbh, (2) fan 20 hp, (2) fans 15 hp, condensing unit 812 mbh, 70 ton ERU-3/ RTU - maintenance- 22000 CFM, DX cooling 778 mbh, heating coil 1618 mbh, (2) fan 20 hp, (2) fans 15 hp, condensing unit 812 mbh, 70 ton ERU 4 /RTU - locker rm - 3400 cfm, DX cooling 88 mbh, heating coil 182 mbh, fan 2 hp, condensing unit 1,14 ton ERU 5/ RTU - maintenance- 5500 cfm, DX cooling 512 mbh, heating coil 616 mbh, (1) fan 5 hp	1	ea					
	<b>Subtotal</b>							\$690,000.
23 7300	<b>FACTORY ASSEMBLED AIR HANDLING UNITS</b> HV-1 handling unit 1200 cfm, heating 46 mbh, fan 1 hp, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface HV-2 handling unit 1900 cfm, fan 2 hp, heating 68 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface HV-3 handling unit 1200 cfm, fan 1 hp, heating 58 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface	1	ea					
	<b>Subtotal</b>							



**Department of  
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CONTRACTOR'S BID BREAKDOWN FORM

**CONTRACT 1 - GENERAL CONSTRUCTION**

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S

Sponsor Agency: DSNY

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
	MU-1 handling unit 13000 cfm, fan 10 hp, heating 810 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface	1	ea					
	MU-2 handling unit 17000 cfm, fan 15 hp, heating 1100 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface	1	ea					
	MU-3 handling unit 10000 cfm, fan 10 hp, heating 606 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface	1	ea					
	MU-4 handling unit 17000 cfm, fan 15 hp, heating 1100 mbh, filters, access sections, down flow supply and return, 208/3/60, unitary controls, ATC / BMS interface	1	ea					
	GMU-1, 2 glycol make-up unit (tank 55 gal, with pump, expansion tank strainer and valves)	2	ea					
	<b>Subtotal</b>							\$816,000.
<b>23 7306</b>	<b>FANS</b>							
	EF-1, 2, 3, 4 centrifugal exhaust 6000 cfm, 1 1/2 hp (roof mounted)	4	ea					
	EF-5 centrifugal exhaust 600 cfm, 1/4 hp (roof mounted)	1	ea					
	EF-6, 8 centrifugal exhaust 4200 cfm, 1 hp (roof mounted)	2	ea					
	EF-7 centrifugal exhaust 1500 cfm, 1/2 hp (roof mounted)	1	ea					
	EF-9, 10, 12, 14 centrifugal exhaust 8000 cfm, 1 1/2 hp (roof mounted)	4	ea					
	EF-11, 13 centrifugal exhaust 6500 cfm, 1 1/2 hp (roof mounted)	2	ea					
	EF-15 belt drive mixed flow 12000 cfm, 1 hp (roof mounted)	1	ea					
	EF-16, 17 belt drive mixed flow 17000 cfm, 5 hp (roof mounted)	2	ea					
	EF-18 belt drive mixed flow 13000 cfm, 3 hp (roof mounted)	1	ea					
	EF-19 centrifugal exhaust 500 cfm, 1/10 hp (roof mounted)	1	ea					
	TP-1, 2 Centrifugal utility fan - backward inclined wheel - 3450 cfm, 7 1/2 hp - inline	2	ea					

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S

Sponsor Agency: DSNY

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
	TP-3 Centrifugal utility fan - backward inclined wheel - 1720 cfm, 2 hp	1	ea					
	WE-1 cube exhaust 5600 cfm, 1 hp (roof mounted)	1	ea					
	TE-1 centrifugal exhaust 500 cfm, 1/10 hp (roof mounted)	1	ea					
	TE-2 centrifugal exhaust 500 cfm, 1/10 hp (roof mounted)	1	ea					
	TE-3 centrifugal exhaust 150 cfm, .03 hp (roof mounted)	1	ea					
	TE-5 centrifugal exhaust 250 cfm, 1 hp (roof mounted)	1	ea					
	EF-20 belt drive mixed flow, 8000 cfm, 1 1/2 hp (roof mounted)	1	ea					
	CAF-1 centrifugal exhaust 1800 cfm, 1/2 hp (boiler room)	0	ea					
	PE-1, 2 centrifugal exhaust 100 cfm, .1 hp (roof mounted) -pantry exhaust	2	ea					
	Subtotal							\$115,000.
<b>23 8440</b>	<b>SPACE HEATING UNITS</b>							
	UH-1,2,3, 5 hot water unit heater 188,7 mbh, 4620 cfm, 1/2 hp	4	ea					
	UH-4 hot water unit heater 89,3 mbh, 1655 cfm, 1/15 hp		ea					
	UH-6, 7, 8 hot water unit heater 147,2 mbh, 3500 cfm, 1/3 hp	1	ea					
	UH-9-18 hot water unit heater 162 mbh, 3610 cfm, 1/3 hp	3	ea					
	CHW-AS-1, 2 air separator 190 gpm	10	ea					
	HW-AS-1 air separator 300 gpm	2	ea					
	CHW-ET-1 expansion tank 108 gal	1	ea					
	CHW-ET-2 expansion tank 102 gal	1	ea					
	HW-ET-1 expansion tank 220 gal	1	ea					
	Subtotal							\$12,000.
<b>23 8500</b>	<b>VARIABLE FREQUENCY CONTROLLERS</b>							
	VFD 1 hp- furnish only	3	unit					
	VFD 1 1/2 hp- furnish only	7	unit					
	VFD 2 hp- furnish only	1	unit					
	VFD 3 hp- furnish only	1	unit					



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CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S  
 Sponsor Agency: DSNY

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
	VFD 5 hp- furnish only	3	unit					
	VFD 7.5 hp- furnish only	2	unit					
	VFD 10 hp- furnish only	2	unit					
	VFD 15 hp- furnish only	1	unit					
	VFD 20 hp- furnish only	1	unit					
	<b>Subtotal</b>							\$60,000.
23 8520	CARBON MONOXIDE CONTROL SYSTEMS (included w/ 230923)							
23 8600	ELECTRIC MOTOR CONTROLLERS (included w/ 236220)							
26 0000	<b>ELECTRICAL</b>							
26 0265	<b>ELECTRICAL TESTING, ADJUSTING AND BALANCING</b>							
	Terminations, commissioning & testing		ls					
	Temp Light and Power:							
	Temporary generator, 500kw, 4 week rental		ls					
	Temporary feeders		ls					
	<b>Subtotal</b>							\$215,000.
26 0280	<b>EQUIPMENT CONNECTIONS AND COORDINATION</b>							
	Motorized dampers	10	ea					
	Toggle switch	12	ea					
	5KVA transformer (for boiler)		ea					
	Control panel (F.B.O.)	5	ea					
	Unit heater	18	ea					
	Energy recovery unit (2 @ 20HP)	3	ea					
	Boiler B-3, B-4	2	ea					
	Hot water pump HWP-4, HWP-5 (10HP)	2	ea					
	Chilled water pump CHWP-1, CHWP-2 (5HP)	2	ea					



Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delic Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

DDC ID: S136-3835  
 Sponsor Agency: DSNY

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
	Heating/ventilation unit HV-1, HV-2, HV-3	3	ea					
	Make-up unit MU-1 (15HP)	1	ea					
	Make-up unit MU-3 (10HP)	1	ea					
	Make-up unit MU-2, MU-4 (20HP)	2	ea					
	Energy recovery unit ERU-4, ERU-5	1	ea					
	Fan	20	ea					
	Chiller CH-1	1	ea					
	New manhole	1	ea					
	Work in new manhole	1	ls					
	Property line box	1	ea					
	Demolition (disconnect and make safe for demo by other trades)	98	sf					
	Shutdown/switchover	2	ls					
	Tap to existing service	1	ls					
	Re-feed existing panels from new 4000 Amp service	3	ls					
	Vibration Isolation/seismic restraint	14	ls					
	Cutting/patching	1	ls					
	Lighting protection/grounding system	1	ls					
	Site specific requirements, deliveries, etc.	1	ls					
	Con Edison Cost - New Service, Transformer		ea					
	Subtotal							\$535,000.
26 0619	600 VOLT WIRE AND CABLE							
	Feeders:							
	600 MCM	3,080	#					
	500 MCM		#					
	500 MCM (incoming service)	1,900	#					
	250 MCM	3,234	#					
	# 4/0 wire	348	#					
	# 3/0 wire	842	#					
	# 1/0 wire	103	#					



**Department of  
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CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder:

Sponsor Agency: DSNY

DDC ID: S136-383S

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
	# 2 wire	875	lf					
	# 4 wire	808	lf					
	# 6 wire	175	lf					
	Mechanical Equipment:							
	500 MCM	2,097	lf					
	250 MCM	694	lf					
	# 4/0 wire	450	lf					
	# 3 wire		lf					
	# 4 wire		lf					
	# 6 wire	1,045	lf					
	# 8 wire		lf					
	# 10 wire	166	lf					
	# 12 wire	28,060	lf					
	# 12 wire (lighting)		lf					
	# 12 wire (power devices)		lf					
	Subtotal							\$300,000.
26 0526	<b>GROUNDING SYSTEM</b>							
	Grounding conductor		lf					
	Test wells	6	ea					
	Welded connection		ea					
	3/4" x 10' ground rod	25	ea					
	Subtotal							\$40,000.
26 0533	<b>RACEWAYS AND BOXES</b>							
	Feeders							
	4" RGS (incoming service)	390	lf					
	4" conduit	164	lf					
	2 1/2" conduit	918	lf					
	Mechanical Equipment							



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delic Construction Co., Inc.

CONTRACTORS BID BREAKDOWN FORM  
 CONTRACT 1 - GENERAL CONSTRUCTION

DDC ID: S136-383S  
 Sponsor Agency: DSNY

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
	3 1/2" RGS	659	#					
	3" RGS	218	#					
	2 1/2" RGS	137	#					
	3/4" RGS	7,473	#					
	3/4" conduit (lighting)		#					
	3/4" RGS (power devices)		#					
	Wall penetration & firestopping		ls					
	Subtotal							\$463,000.
26 0653	IDENTIFICATION FOR ELECTRICAL SYSTEMS (included w/ other Div 26 sections)							
26 0800	COMMISSIONING OF ELECTRICAL (included w/ 260265)							
26 2416	PANLEBOARDS							
	400 Amp panel "MP-G", 2-sections	1	ea					
	225 Amp panel "MP-S", 2-sections	1	ea					
	225 Amp panel "MP-B", "MP-B-E", "MP-G-E", "MP-S-E"	4	ea					
	4000 Amp meter and CT cabinet	1	ea					
	Panel mounting assembly	8	ea					
	Subtotal							\$480,000.
26 2726	WIRING DEVICES							
	GFI duplex receptacle, VWP (dedicated circuit)	27	ea					
	Subtotal							\$17,000.
26 2813	FUSES (600 V AND LESS) (included w/ other Div 26 sections)							
26 2816	DISCONNECT SWITCHES							
	400 Amp NEMA 3R disconnect switch	5	ea					



**Department of  
Design and  
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CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement

Location: 1000 West Service Road, Staten Island, NY 10314

Bidder: Delric Construction Co., Inc.

DDC ID: S136-383S

Sponsor Agency: DSNY

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
	100 Amp NEMA 3R disconnect switch	3	ea					
	60 Amp NEMA 3R disconnect switch	2	ea					
	60 Amp NEMA 1 disconnect switch	2	ea					
	30 Amp NEMA 3R disconnect switch	19	ea					
	<b>Subtotal</b>							\$52,000.
26 2913	<b>INSTALLATION OF INDIVIDUAL MOTOR CONTROLLERS</b>							
	VFD (up to 25HP) - F.B.O.	16	ea					
	<b>Subtotal</b>							\$64,000.
26 2919	<b>SWITCHBOARDS</b>							
	4000 Amp switchboard	1	ea					
	1600 Amp distribution board	1	ea					
	<b>Subtotal</b>							\$180,000.
26 3100	<b>SOLAR PHOTOVOLTAIC SYSTEM</b>							
	280W module (Trina Solar All Max Plus or approved equal)	1,104	ea					
	DC combiner box	16	ea					
	15KW inverter (Fronius SYMO or approved equal)	16	ea					
	800 Amp panel "DP-PV"	1	ea					
	Miscellaneous PV System requirements/testing		ls					
	600 Volt Wire and cable:							
	Photovoltaic System:							
	600 MCM	3,080	lf					
	# 1/0 wire	103	lf					
	# 8 wire	22,568	lf					
	# 10 wire	10,040	lf					
	Raceways and Boxes							
	4" conduit	77	lf					
	1 1/2" RGS	1,760	lf					



Project: DSNY District S13 Garage and Repair Shop – HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Detric Construction Co., Inc.

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

DDC ID: S136-3835  
 Sponsor Agency: DSNY

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
	1" RGS		#					
	1" conduit		#					
	<b>Subtotal</b>							\$3,100,000.
26 4113	<b>LIGHTNING PROTECTION SYSTEM</b>							
	Lightning protection conductor		#					
	Air terminal		ea					
	Miscellaneous system requirements		ls					
	<b>Subtotal</b>							\$150,000.
26 5000	<b>LUMINAIRES AND ACCESSORIES</b>							
	Lighting fixture type "V/1"		ea					
	Occupancy sensor, ceiling mounted		ea					
	3-way dimmer		ea					
	<b>Subtotal</b>							\$20,000.
28 0000	<b>ELECTRONIC SAFETY AND SECURITY</b>							
28 3100	<b>FIRE ALARM LIFE-SAFETY SYSTEM</b>							
	Fire alarm control panel		ea					
	Data gathering panel		ea					
	Notification appliance circuit panel		ea					
	Pull station		ea					
	Strobe light		ea					
	Combination horn/strobe		ea					
	Smoke detector		ea					
	Carbon monoxide detector		ea					
	Heat detector		ea					
	Smoke detector, duct mounted		ea					
	Fire alarm sprinkler bell		ea					
	Tamper switch		ea					

CONTRACT 1 - GENERAL CONSTRUCTION

Project: DSNY District S13 Garage and Repair Shop - HVAC System and Roof Replacement  
 Location: 1000 West Service Road, Staten Island, NY 10314  
 Bidder: Delric Construction Co., Inc.

DDC ID: S136-3833  
 Sponsor Agency: DSNY

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
	Pressure switch		ea					
	Waterflow switch		ea					
	30 Amp NEMA 1 disconnect switch		ea					
	Programming/testing/fees		ls					
	3/4" conduit		lf					
	# 12 wire		lf					
	Subtotal							\$106,000.
<b>31 0000</b>	<b>EARTHWORK</b>							
<b>31 2333</b>	<b>EXCAVATION AND FILLING</b>							
	Replace steel faced concrete curb at sidewalk as per det 2/A100	80	lf					
	Replace concrete sidewalk with 6" gravel base and compacted subgrade	320	sf					
	Concrete and gravel base for asphalt pavement as per det 2/A100	240	sf					
	Replace existing asphalt as per det 2/A100	240	sf					
	Subtotal							\$65,000.
	<b>TOTAL CONTRACT 1 - GENERAL CONSTRUCTION WORK</b>							<b>\$20,985,000</b>



**BID BOOKLET  
PART B**

## 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. This Safety Questionnaire will be reviewed as per Section V of the Safety Requirements for Construction Contracts, found in Volume 2 of the Contract.

### 1. Bidder Information:

Company Name: Delic Construction Co., Inc.

DDC Project Number: S136-3835

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:

Identify the types of work that the Bidder has performed in the last three years, and the types of work that are part of this Contract.

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

### 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 Bidder / Contractor may obtain its EMR by contacting its insurance broker or the NCCI. If the Bidder cannot obtain its EMR, it must submit a written explanation as to why.

The Bidder 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
2018	_____	1.05
2017	_____	1.16
2016	_____	1.17

If the Intrastate and/or Interstate EMR for any of the past three years is greater than 1.00, the Bidder / 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 a New York City Department of Buildings (NYCDOB) construction-related violation within the last three years.
- YES     NO    Contractor has had an incident requiring OSHA notification within 8 hours (all work-related fatalities) or an incident requiring OSHA notification within 24 hours (work-related in-patient hospitalization, amputation and all loss of an eye).

The OSHA Form 300 "Log of Work-Related Injuries and Illnesses" and OSHA Form 300A "Summary of Work-Related Injuries and Illnesses" must be submitted for the last three years for Contractors with more than ten employees.

The Bidder / Contractor must indicate the total number of hours worked by its employees, as reflected in payroll records for the past three (3) years.

The Bidder / Contractor must submit the Incident Rate for Lost Time Injuries (the Incident Rate) for the past three (3) 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 Form 300 and OSHA Form 300A. The 200,000 hours represents the equivalent of 100 employees working forty hours a week, fifty (50) 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
2018	57,015	3.50
2017	49,156	0.00
2016	62,736	6.37

If the Bidder's / 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 Bidder / 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    Fatality or an incident requiring OSHA notification within 24 hours (work-related in-patient hospitalization, amputation and all loss of an eye) on DDC Project(s) within the last three (3) years.

DDC Project Number(s): \_\_\_\_\_

The Bidder hereby affirms that all the information provided in this Safety Questionnaire and all additional pages and/or attachments, if applicable, consist of accurate representations.

Date: 10/25/19

By:   
(Signature of Bidder: Owner, Partner, Corporate Officer)

Title: Vice President

## 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) 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 -- CONTRACTS COMPLETED BY THE BIDDER**

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

Project & Location	Contract Type	Contract Amount (\$000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner
Passaic County Technical Institute 37 Reinhardt Rd., Wayne, NJ 07470	Business Office Expansion	\$600,385.	06/15	A&A Const. Mgmt, 973-882-2622	Comerio Coppa Architects 973-890-8989
NYCSCA - PS 199 50-14 44th St., Woodside, NY 11377	Renovation	\$9,260,805.	07/15	Frank Pagano 718-752-5692	Alvin Broderick 718-472-8000
Passaic County Community College Memorial Hall Building 1 College Plaza, Paterson, NJ 07505	Addition	\$1,346,556.	08/15	A&A Const. Mgmt. 973-882-2622	Comerio Coppa Architects 973-890-8989
NYCSCA - PS 183 76 Riverdale Ave., Brooklyn, NY 11212	Exterior Masonry	\$8,481,000.	09/16	Igor Mikhlín 718-752-5790	NYCSCA 718-472-8000
Passaic County Community College Hamilton Hall Building 1 College Plaza, Paterson, NJ 07505	Renovations	\$3,555,910.	01/16	A&A Const. Mgmt. 973-882-2622	Comerio Coppa Architects 973-890-8989
NYCSCA - PK 672 1223 Coney Island Ave. Brooklyn, NY 11230	Renovations	\$7,427,571.	08/17	Glen Crandall 718-472-8124	NYCSCA 718-472-8000
NJSDA - Egg Harbor Twsp. H.S. 24 High School Dr. Egg Harbor, NJ 08234	Roof Repair	\$1,295,871.	11/17	Corrado Minervini 609-943-5955	OCA Architects 973-732-0656
Montclair State University Mallory Hall 1 Normal Ave. Montclair, NJ	Renovation & Addition	\$15,762,605.	05/18	Chris Daubish 973-879-4679	Clarke, Canton & Hintz 609-883-8383 ext 343

**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
Rangel House 159-16 Harlem River Dr. NY, NY 10039	Major Renovations	\$25,988,098.	\$9,731,431.	\$755,873.	07/19	Greg Gaydosch 212-306-8551	Liro Group 212-563-0280
PK 444 606 West 57th St. NY, NY 10019	Renovations for a New Pre K	\$6,592,000.	\$2,660,388.	\$236,575.	07/19	Roman Hatala 718-752-5546	NYCSCA 718-472-8000
HS / IS 89 15-A Fairfield St. S.I., NY 10308	New HS	\$36,967,841.	\$18,724,531.	\$24,345,340.	10/20	Jin Kim 929-407-6106	NYCSCA 718-472-8000
IS 93 66-56 Forest Ave. Ridgewood, NY 11385	Renovations	\$19,739,121.	\$7,924,306.	\$18,226,825.	11/20	Frank Pagano 917-542-6900	NYCSCA 718-472-8000
Beach 41st St. 38-20 Beach Chanel Dr. Far Rockaway, NY 11691	Sandy Recovery Renovations	\$29,379,000.	\$12,717,750.	\$29,379,000.	12/20	Mark Sadowski 646-747-0638	HAKS 212-747-1997



## PASSPort COMPLIANCE

All vendors that intend to do business with the City of New York must complete a disclosure process in order to be considered for a contract. This disclosure process was formerly completed using Vendor Information Exchange System (VENDEX) paper-based forms. The City of New York has moved collection of vendor disclosure information online. In early August 2017, the New York City Mayor's Office of Contract Services (MOCS) launched the **Procurement and Sourcing Solutions Portal (PASSPort)**, a new online procurement system that replaced the paper-VENDEX process. In anticipation of awards, all bidders must create online accounts in the new PASSPort system, and file all disclosure information using PASSPort. **Paper submissions, including certifications of no changes to existing VENDEX packages, will not be accepted in lieu of complete online filings using PASSPort.**

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

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

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

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

## CONSTRUCTION EMPLOYMENT REPORT

All bidders will be required to submit either a Construction Employment Report (CER) if the bid amount is \$1,000,000 or greater.

The CER template form is available online at:

[https://www1.nyc.gov/assets/sbs/downloads/pdf/businesses/DLS\\_Constru\\_Employ\\_Rpt.pdf](https://www1.nyc.gov/assets/sbs/downloads/pdf/businesses/DLS_Constru_Employ_Rpt.pdf)

Instructions for completing the Construction Employment Report are available online at:

[https://www1.nyc.gov/assets/sbs/downloads/pdf/businesses/DLS\\_Cons\\_Employ\\_Rpt\\_Inst.pdf](https://www1.nyc.gov/assets/sbs/downloads/pdf/businesses/DLS_Cons_Employ_Rpt_Inst.pdf)

## 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 Section 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**

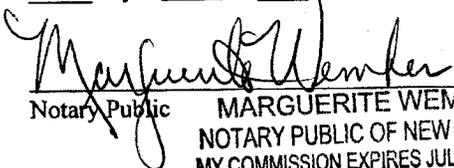
- By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief, that each bidder/proposer 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.

  
\_\_\_\_\_  
SIGNATURE

Anthony Della Cerra  
\_\_\_\_\_  
PRINTED NAME

Vice President  
\_\_\_\_\_  
TITLE

Sworn to before me this  
25th day of Oct., 20 19

  
\_\_\_\_\_  
Notary Public MARGUERITE WEMKEN  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES JULY 27, 2022

Dated:

FMS ID: S136-383S



Department of  
Design and  
Construction

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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**

# **DSNY SI District 3 Garage 7 Repair Shop HVAC System & Roof Replacement**

**LOCATION:                      1000 West Service Road  
BOROUGH:                    Staten island, NY 10314  
CITY OF NEW YORK**

---

Contractor \_\_\_\_\_

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

---

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

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

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





Department of Design and Construction

PROJECT ID: S136-383S

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

**DSNY District S13 Garage and Repair  
Shop – HVAC System and Roof  
Replacement**

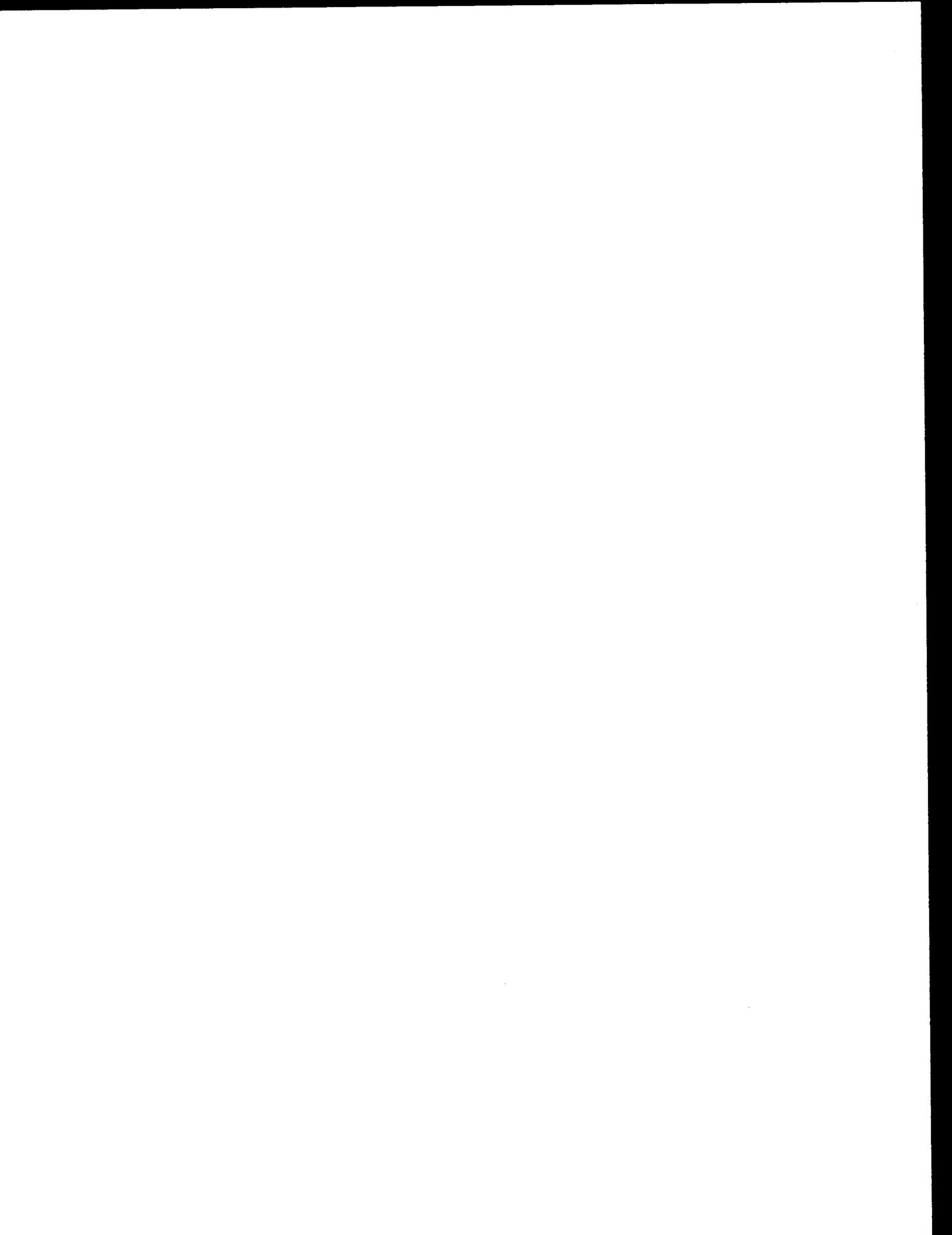
LOCATION: 1000 West Service Road  
BOROUGH: Staten Island, NY 10314  
CITY OF NEW YORK  
CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

New York City Department of Sanitation

WSP USA Inc.

Date: June 28, 2019







Department of  
Design and  
Construction

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

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





# NOTICE TO BIDDERS

Please be advised the Project Labor Agreement (PLA) attached and incorporated in this Invitation for Bids has been extended to apply to contracts let prior to September 30<sup>th</sup>, 2019, including this contract. Other than extending the expiration date, all other terms of the PLA continue to apply in full force and effect.

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## **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 project receives State funding and therefore is subject to the requirements of Article 15-A of the Executive Law.

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

**A.** Referrals will be from the respective signatory locals and/or locals listed in Schedule A of the PLA. Contractors may utilize 'traveler provisions' contained in the local 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 trustee 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 (Updated May 2016)

## **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, DRILLRUNNERS & MINERS 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 14<sup>th</sup> 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 35<sup>th</sup> Avenue  
Long Island City, NY 11106  
Phone: (718) 392-5077  
Fax: (718) 392-5087  
Business Manager: Alex Castaldi

**DERRICKMEN & RIGGERS LOCAL 197**

35-53 24<sup>th</sup> Street  
Long Island City, NY 11101  
Phone: (718) 361-6534  
Fax: (718) 361-6584  
Business Manager: William Hayes  
[Billhayes197@yahoo.com](mailto:Billhayes197@yahoo.com)

**DRYWALL TAPERS 1974**

265 West 14<sup>th</sup> 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 27<sup>th</sup> Avenue  
Long Island City, NY 11101  
Phone: (718) 767-7004  
Fax: (718) 767-6730  
Business Manager: Lenny Legotte  
[llegotte@localoneiuec.com](mailto:llegotte@localoneiuec.com)

**ENGINEERS LOCAL 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**

44-40 11<sup>th</sup> Street  
Long Island City, NY 11101  
Phone: (212) 929-5327  
Business Manager: Tom Callahan

**ENGINEERS NO. 30**

16-16 Whitestone Expressway  
Whitestone, NY 11357  
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](mailto: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: Steve Birmingham

**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](mailto: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 COUNCIL**

22 West 46<sup>th</sup> Street  
New York, NY 10036  
Phone: (212) 302-1868  
Business Manager: James Mahoney  
[jmahoney@iwintl.org](mailto:jmahoney@iwintl.org)

**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  
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 8<sup>th</sup> Avenue  
New York, NY 10018  
Phone: (212) 452-9400  
Fax: (212) 452-9499  
Business Manager: Robert Bonanza

**METAL POLISHERS**

**LOCAL UNION NO. 8A-28A**

36-18 33<sup>rd</sup> Street 2<sup>nd</sup> Fl.  
Long Island City, NY 11106  
Phone: (718) 361-1770  
Fax: (718) 361-1934  
Business Manager: Hector Lopez

**MILLWRIGHT AND MACHINERY**

**ERECTORS LOCAL NO. 740**

89-07 Atlantic Avenue  
Woodhaven, NY 11412  
Phone: (718) 849-3636  
Fax: (718) 849-0070  
Business Manager: Joseph Geiger

**ORNAMENTAL IRON WORKERS**

**NO. 580**

501 West 42<sup>nd</sup> Street  
New York, NY 10036  
Phone: (212) 594-1662  
Fax: (212) 564-2748  
Business Manager: Pete Myers

**PAINTERS DISTRICT**

**COUNCIL NO. 9**

45 West 14<sup>th</sup> Street  
New York, NY 10011  
Phone: (212) 255-2950  
Fax: (212) 255-1151  
Business Manager: Joseph Azzopardi

**PAINTERS STRUCTURAL STEEL**

**NO. 806**

40 West 27<sup>th</sup> 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) 886-3310  
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 Square, Suite 600  
Long Island City, NY 11101  
Phone: (718) 937-7010 ext. 244  
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: Kevin Connors

**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: Bob Bartels

**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 & DOCKBUILDERS 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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NYC AGENCY RENOVATION & REHAB CITY OWNED  
BUILDINGS/STRUCTURES PLA

**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;

NYC AGENCY RENOVATION & REHAB CITY OWNED  
BUILDINGS/STRUCTURES PLA

- (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

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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 trusteed Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to Program Work done under this Agreement and only for those employees to whom this Agreement requires such benefit payments.

D. 1. To the extent consistent with New York City's Procurement Policy Board Rules with respect to prompt payment, as published at [www.nyc.gov/ppb](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

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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
Elevator Constructors Union Local No. 1

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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. 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
Internationals 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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ADDITIONAL PARTICIPATING UNIONS

Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers
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ADDITIONAL PARTICIPATING UNION SCHEDULE A

Union	Current Agreement with:
Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Independent
Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Associated Brick Masons Contractors
Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Building Restoration Contractors Association
Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Building Contractors Association
The Stone Setters of Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Independent
The Plasterers of Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers	Independent

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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 District S13 Garage & Repair Shop and located at 1000 West Service Rd. Staten Island, NY 10314 (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: 11/8/19

Delric Construction Co., Inc.

(Name of Contractor or subcontractor)



(Authorized Officer & Title) Anthony Della Cerra, Vice President

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

845 Belmont Avenue, North Haledon, New Jersey 07508

(Address)

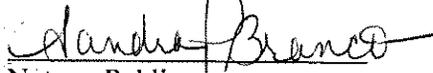
973-427-0058 Phone 973-427-0377 Fax

(Phone) (Fax)

Contractor's State License

# 603476

Sworn to before me this  
8th day of November

  
Notary Public

**SANDRA P. BRANCO**  
**NOTARY PUBLIC OF NEW JERSEY**  
**My Commission Expires 7/14/2023**

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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.



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

**INFORMATION FOR BIDDERS**

**JUNE 2019**

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*CITY OF NEW YORK CITY  
DEPARTMENT OF DESIGN AND CONSTRUCTION  
INFORMATION FOR BIDDERS*

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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, VOLUME 1 OF 3.

### 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. PASSPort COMPLIANCE

All vendors that intend to do business with the City of New York must complete a disclosure process in order to be considered for a contract. This disclosure process was formerly completed using Vendor Information Exchange System (VENDEX) paper-based forms. The City of New York has moved collection of vendor disclosure information online. In early August 2017, the New York City Mayor's Office of Contract Services (MOCS) launched the Procurement and Sourcing Solutions Portal (PASSPort), a new online procurement system that replaced the paper-VENDEX process. In anticipation of awards, all bidders must create online accounts in the new PASSPort system, and file all disclosure information using PASSPort. Paper submissions, including certifications of no changes to existing VENDEX packages, will not be accepted in lieu of complete online filings using PASSPort.

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

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

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

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

25. Complaints About the Bid Process

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

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in Attachment 1 (BID BOOKLET, VOLUME 1 OF 3). 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 215-364-6465; (2) through the Internet at <https://www.fiscal.treasury.gov/surety-bonds/>.

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

27. Failure to Execute Contract

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

28. Bidder Responsibilities and Qualifications

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

(B) The Agency may require any bidder or prospective bidder to furnish all books of account, records, vouchers, statements or other information concerning the bidder's financial status for examination as may be required by the Agency to ascertain the bidder's responsibility and capability to perform the Contract. If required, a bidder must also submit a sworn statement setting forth such information as the Agency may require concerning present and proposed plant and equipment, the personnel and qualifications of 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 in the BID BOOKLET, VOLUME 1 OF 3.

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 FOR CONSTRUCTION**  
**CONTRACTS**

February 2019

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

- I. POLICY ON SITE SAFETY**
- II. PURPOSE**
- III. DEFINITIONS**
- IV. RESPONSIBILITIES**
- V. SAFETY QUESTIONNAIRE**
- VI. SITE SAFETY PLAN**
- VII. KICK-OFF/PRE-CONSTRUCTION MEETINGS AND SAFETY REVIEW**
- VIII. EVALUATION DURING WORK IN PROGRESS**
- IX. SAFETY PERFORMANCE EVALUATION**

## I. POLICY ON SITE SAFETY

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

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

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

## II. PURPOSE

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

## III. DEFINITIONS

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

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

**Construction Safety Auditor:** A representative of the 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 audits, reviewing safety plans, reviewing construction permits, drawings, verifying Contractor's compliance with applicable federal, state and city laws, rules, regulations, and DDC Contract Safety Requirements, etc. and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

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

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

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

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

**Director - Construction Safety:** Responsible for the operations of the Construction Safety Unit and the DDC Site Safety management programs.

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

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

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

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

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

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

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

**Site Safety Plan:** A site-specific safety plan developed by the Contractor for a DDC project. The Site Safety Plan will identify hazards associated with the project work and include project specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan will be submitted within 30 days from the Award Date or as otherwise directed and is subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site.

**Unsafe or Unhealthy Condition:** A condition that could be potentially hazardous to the health and safety of personnel or the public, and/or damaging to equipment, machinery, property, or the environment.

**Weekly Safety Meetings:** Weekly jobsite safety meetings, given to all jobsite personnel by Contractor, with the purpose of discussing general safety topics and job specific requirements encountered at the DDC work site. Weekly safety meetings will be documented and will include at a minimum, topics, name and signature of the person conducting the meeting, names and signatures of attendees, contractor's name, DDC Project ID, date, and location.

**Work:** The construction required by the Contractor's Contract Documents whether completed or partially completed, performed by the Contractor/ subcontractors. Work refers to the furnishing of labor, furnishing and incorporating materials and equipment into the construction and providing any service required by the Contract Documents to fulfill the Contractor's obligation to complete the Project.

#### **IV. RESPONSIBILITIES**

All persons who manage, perform, and provide support for construction projects will conduct operations in compliance with the requirements identified in this Policy and all applicable governing regulatory agency requirements and guidelines pertaining to safety in construction.

##### **A. Resident Engineer**

1. Review and facilitate Contractor(s) Site Safety Plan submittals to DDC for acceptability.
2. Notify the Construction Safety Unit of the commencement of construction work.
3. Develop and implement a training verification process to ensure that all CM/REI, consultant, Contractor, and subcontractor employees are properly trained. Maintain all applicable initial and refresher training records and assures documentation availability on site.
4. Maintain documentation of and attend weekly safety meetings and daily safety job briefings.
5. Assure that Contractor(s) JHA's are current to reflect the work tasks being performed, hazards, and control methods to mitigate the identified hazards. Verify that all employees at the job site are trained on the JHAs and maintain supporting documentation on site.
6. Assure adequate planning for all critical construction activities (crane operation, excavation, confined space entry, etc.) including coordination between Contractor(s) /DDC/ other Agencies as required.
7. Maintain custody of all construction related permits, plans, approvals, drawings, etc., related to the project and assure their availability on site.
8. Recognize, minimize, or eliminate jobsite and public hazards, through required planning, inspection, verification, and corrective action process.
9. Monitor the conditions at the site for conformance with the Contractor's Site Safety Plan, DDC policies, permits, and all applicable regulations and documentation that pertain to construction safety.
10. Notify the Contractor and DDC immediately upon determination of any condition or activity existing which is not in compliance with the Contractor's Site Safety Plan, applicable federal, state or local codes or any condition that presents a potential risk of injury to the public or workers or possible damage to property. Direct the Contractor to provide such labor, materials, equipment, and supervision to remedy such conditions.

11. Notify the Construction Safety Unit and the ACCO's Insurance and Risk Management Unit of project-related accidents, incidents, and near misses as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure within two (2) hours.
12. In case of an accident, incident, or near miss, RE is responsible to protect the integrity of the accident site including but not limited to: the safeguarding of all evidence, documentation of all personnel on site at the time of the accident, gather facts related to all accidents, incidents, or near miss, and prepare required DDC Construction Accident Report as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure. Maintain all records pertaining to accidents, incidents, and near miss and have them available upon request.
13. Notify the Construction Safety Unit within two (2) hours of the start of an inspection by any outside/regulatory agency personnel, including NYS, OSHA, NYC DOB or any other City/State/Federal oversight entity and forward a copy of the inspection report within one business day of its receipt.
14. Escort and assist Construction Safety Auditors during all field and record audits.
15. Report any emergency conditions to the Construction Safety Unit immediately.

**Note: In addition to the responsibilities listed above, if the Resident Engineer is a CM/REI or other non-City party hired by the City to manage the Project, the Resident Engineer is also required to do the following:**

16. Provide personnel who are certified and or trained appropriately for the requirements of the project.
17. Perform an investigation for any project-related accidents, incidents, and near misses. Within 24-hours of the time of the accident, incident, or near miss, the CM/REI will submit an investigation report to the Construction Safety Unit. Such report will include proposed remedial measures and implementation of corrective actions to prevent recurrence.

DDC reserves the right to request that the CM/REI replace any CM/REI personnel for any reason at any time during the project.

#### **B. Construction Contractors**

**Note: For CM-Build and CM-Design-Build Projects, the CM will meet all requirements listed in this section, as well as the Resident Engineer section above.**

1. Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
2. Submit a Site Safety Plan within 30 days from the Award Date or as otherwise directed. The Site Safety Plan is subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. The Site Safety Plan will be revised and updated as necessary during the course of the project.
3. Designate and identify a Project Safety Representative in the Site Safety Plan. The Contractor will immediately notify the Construction Safety Unit, in a form and manner acceptable to the Construction Safety Unit, of any permanent change to the designated Project Safety Representative. In the event the primary designated Project Safety Representative is temporary unable to perform his or her duties, an alternate Project Safety Representative will be provided. Resumes, outlining the qualification and experience for the Project Safety Representative (s) will be included in the Site Safety Plan and available upon request. DDC reserves the right to request the Contractor to replace a Project Safety Representative for any reason at any time during the course of the project.
4. Designate and identify a Competent Person(s) in the Site Safety Plan. Contractor/subcontractor may be required to provide more than one competent person due to construction operations and based on a number of work tasks/areas. DDC reserves the right to request the Contractor to replace a Competent Person or provide additional Competent Person(s) for any reason at any time during the course of the project. The Competent Person will be present at the site during all work activities.
5. For certain projects, as defined in New York City Construction Codes – Title 28, designate and identify the Licensed Site Safety Manager or Registered Construction Superintendent. Resumes, outlining the qualification and experience for the Licensed Site Safety Manager or Registered Construction Superintendent will be included in the Site Safety Plan and available upon request. The Contractor will immediately notify the Construction Safety Unit, in a form and manner acceptable to the Construction Safety Unit, of any permanent change to the designated Site Safety Manager and/or Construction Superintendent. In the event the primary designated Site Safety Manager or Construction Superintendent is temporarily unable to perform his

or her duties, an alternate Licensed Site Safety Manager and/or Registered Construction Superintendent will be provided. The Construction Safety Unit must be informed of such change. DDC reserves the right to request the Contractor to replace Site Safety Manager or Construction Superintendent for any reason at any time during the course of the project.

6. Develop a written Job Hazard Analysis (JHA) that identifies safety hazards and control methods for project specific work tasks. A preliminary JHA will be included in the Site Safety Plan submitted by the Contractor. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop during the course of the project and will be present at the worksite and produced upon request.
7. Develop project specific safety procedures to protect employees, general public, and property during all construction activities for the duration of the project.
8. Ensure that all employees are aware of the hazards associated with the project through documented formal and informal training and/or other communications. Conduct and document new employee and site-specific safety orientation for all Contractor and subcontractor personnel to review the hazards associated with the project as identified in the Site Safety Plan and the specific safety procedures and controls that will be used to protect workers, the general public and property. The Project Safety Representative will conduct this training prior to mobilization and if necessary during the course of the project. Documentation will be provided to the RE.
9. Prior to performing any work on DDC project all Contractor's and subcontractor's employees will have successfully completed, within the previous five calendar years, an OSHA 10-hour construction safety course. All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space, etc.) will be provided to the RE prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review.
10. Conduct and document weekly safety meetings and daily job briefing sessions for the duration of the project. Attendance at weekly safety meetings and daily job briefing sessions is mandatory. A written record of weekly safety meetings will be available upon request and job briefing sessions will be available at the worksite.
11. As part of the Site Safety Plan, prepare site specific procedures, such as maintenance and protection of traffic plan, steel erection plan, confined space program, fall protection plan, demolition plan, site specific emergency evacuation plan, etc. (if not otherwise provided in the contract documents) and comply with all of its provisions.
12. Have immediately available for review at the project site where actual construction activities are being performed all applicable documentation, including but not limited to: JHAs for work tasks being performed, all required training records, MPT plan (where applicable), Noise and Dust Mitigation Plans, excavation protective system drawings (where applicable), Emergency Evacuation plan, fall protection program (where applicable), confined space program (where applicable), all required permits, daily job briefing records, all required documentation for crane operation (where applicable), daily inspection checklist, scaffold and sidewalk drawings (when applicable), safety data sheets for chemicals in use.
13. Comply with all federal, state and local safety and health rules, laws, and regulations.
14. Comply with all provisions of the Site Safety Plan.
15. Provide, replace, and adequately maintain at or around the project site, suitable and sufficient signage, lights, barricades and enclosures (fences, sidewalk sheds, netting, bracing, etc.). The project specific MPT plan will be developed, implemented, and reviewed during the course of the project.
16. The Project Safety Representative will conduct daily safety inspections, document the inspection results, implement corrective actions for the identified hazards. Maintain the inspection records and have them available upon request.
17. **Report unsafe or unhealthy conditions to the RE as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions. Should an imminent dangerous condition be discovered, Contractor will stop all work in the area of danger until corrections are made.**
18. Report all accidents, incidents and near misses involving injuries to workers or the general public, as well as property damage, to the RE within one (1) hour.
19. Following an accident or incident, unless otherwise directed, the Contractor will not remove or alter any equipment, structure, material, or evidence related to the accident or incident. Exception: Immediate emergency procedures taken to secure structures, temporary construction, operations, or equipment that pose a continued imminent danger or facilitate assistance for persons who are trapped or who have sustained

- bodily injury. Take additional measures as necessary to secure the accident or incident site and to protect against any further injury or property damage.
20. The Contractor will perform an investigation into the root cause of the accident, incident, or near miss. Within 24 hours of an accident, incident, or near miss, the Contractor will prepare and submit to the RE a written investigation report detailing findings, corrective actions, and hazard mitigation implementation to prevent recurrence.
  21. Notify the RE within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB, or others.
  22. Maintain all records pertaining to all required safety compliance documents, accidents and incidents reports. DDC reserves the right to request copy of any records pertaining to the safety of the project and required by DDC and other federal, state, and city agencies, including but not limited to permits, training records, safety inspection records, drawings, equipment records, etc.
  23. Cooperate with DDC Construction Safety Unit/ RE and address DDC recommendations on safety, which will in no way relieve the Contractor of its responsibilities for safety on the project. The Contractor has sole responsibility for safety.

## **V. SAFETY QUESTIONNAIRE**

DDC requires that all Contractors provide information regarding their current and past safety performance and programs. This will be accomplished by the use of the DDC Safety Questionnaire. As a part of the bid submittal package, the contractor will submit a completed DDC Safety Questionnaire listing company workers' compensation experience modification rating and OSHA Incident Rates for the three (3) years prior to the date of the bid opening. DDC may request a Contractor to update its Questionnaire at any time or to provide more detailed information. The Contractor will provide the requested information within 15 days.

The following criteria will be used by DDC in reviewing the Contractor's responsibility, which will be based on the information provided on the questionnaire:

- Criteria 1: OSHA Injury and Illness Rates (I&IR) are no greater than the average for the industry (based on the most current Bureau of Labor Statistics data for the Contractors SIC code); and
- Criteria 2: Insurance workers compensation Experience Modification Rate (EMR) equal to or less than 1.0; and
- Criteria 3: Any willful violations issued by OSHA or NYC DOB within the last three (3) years; and
- Criteria 4: A fatality (worker or member of public) and injuries, requiring OSHA notification, experienced on or near Contractor's worksite within the last three (3) years; and
- Criteria 5: Past safety performance on DDC projects (accidents; status of site safety plan submittals; etc.)
- Criteria 6: OSHA violation history for the last three (3) years;
- Criteria 7: Contractor will provide OSHA Injury and Illness Records (currently OSHA 300 and 300A Logs) for the last three (3) years.

If the Contractor fails to meet the basic criteria listed above, the 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. SITE SAFETY PLAN**

Within thirty (30) days from the Award Date or as otherwise directed, the Contractor will submit the Site Safety Plan. The Site Safety Plan will identify project work scope, safety hazards associated with the project tasks, and include specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan is subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. Due to the project work scope and project duration, the Construction Safety Unit may grant a conditional acceptance

for a Site Safety Plan without all sections being complete. In a case of a "Conditional Acceptance" of a Site Safety Plan, the Contractor will provide the remaining sections previously incomplete and/or not submitted for review and acceptance by the Construction Safety Unit prior to the commencement of the construction activities. The Construction Safety Unit reserves the right to withdraw the initial "Conditional Acceptance" if the Contractor fails to provide the remaining sections of a Site Safety Plan. Failure by the Contractor to submit an acceptable Site Safety Plan will be grounds for default.

Site Safety Plan requirements: The Site Safety Plan will be a written document and will apply to all project specific Contractor and subcontractor operations, and will have at a minimum, the following elements with each described in a separate section (It may be necessary to modify the basic format for certain unique or high-risk projects, such as tunnels or high-rise construction). All Site Safety Plan sections will be numbered in the order listed below. For sections, which are not applicable for the type of the work being performed by the Contractor on DDC project, the Contractor will in writing indicate "Not applicable based on the project work scope." The Site Safety Plan will include Contractor's name, DDC project ID, project location (s), and development and revision dates. The Site Safety Plan will include the sections, attachments, and appendixes provided in the Site Safety Plan. All pages of the Site Safety Plan will be numbered.

1. Project Work Scope – Detailed information regarding work tasks that will be performed by Contractor and subcontractors under the project.
2. Responsibility and Organization – Contractor's organization chart with responsible personnel for the project, including titles, names, contact information, roles, and responsibilities. All Contractor's personnel required by the DDC Safety Requirements will be identified.
3. Safety Training and Education – OSHA 10 Hours training, requirements for daily safety briefings and weekly safety meetings, any work task specific training, responsible staff for implementation of training program for the project.
4. Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE) to protect workers, property and general public, Contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
5. Protection of Public – Project specific procedures covering safety of the general public during all project construction activities.
6. Hazard Corrective Actions - Procedures for hazard identification, including responsible person(s), frequency of safety inspections, implementation of corrective actions, safety inspection checklist.
7. Accident/Exposure Investigation – Project specific procedures for accident/incident/near miss investigation and implementation of corrective actions. Accident/incident/near miss notification procedure of DDC project staff (timer frame and responsible personnel).
8. Recording and Reporting Injuries – Procedures to meet 29 CFR 1904 requirements.
9. First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
10. Project Specific Fire Protection and Prevention Program – Project specific procedures, including responsible staff, fire alarm system/methods, hot work procedures, etc.
11. Housekeeping Procedure.
12. Project Specific Illumination Procedure.
13. Project Specific Sanitation Procedure.
14. Personal Protective Equipment (PPE), including Respiratory Protection Program and Hearing Conservation Program, if required.
15. Hazard Communication Program – Contractor's Hazard Communication Program, responsible staff; training; SDS records, project specific list of chemicals; location of the program and SDS records.
16. Means of Egress – Information regarding free and unobstructed egress from all parts of the building or structure; exit marking; maintenance of means of egress, etc.
17. Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system/devices, evacuation procedure, procedure to account for employees after evacuation, etc.
18. Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.
19. Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employee's exposure and protection, safety procedures, etc.

20. Material Handling, Storage, Use and Disposal – Project specific information regarding material storage, disposal, and handling: procedures, plan/drawings, etc.
21. Signs, Signals, and Barricades – Use of danger/warning signs, safety instruction signs, sidewalk closure and pedestrian fencing and barricades (if not included in the MPT plan), etc.
22. Tools – Hand and Power – Safety procedures for the type of tools to be used.
23. Scaffold – Project specific scaffold types, procedures, training requirements, scaffold drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; competent person, criteria for project specific scaffold, falling object protection, procedures for aerial lifts/scissor lifts.
24. Welding and Cutting – Project specific procedure for welding and cutting, including all necessary safety requirements such as fire prevention, personal protective equipment, hot work permits (if not covered by Contractor's Fire Prevention and Protection program, FDNY certificate requirements).
25. Electrical Safety – Project specific procedures, including lock out-tag out.
26. Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan, responsible staff.
27. Cranes, Derrick, Hoists, Elevators, Conveyors – project specific equipment information including type, rated load capacity, manufacture specification requirements, competent person, exposure to falling load, inspection, recordkeeping, clearance requirements, communication procedure, ground lines, permits.
28. Excavation Safety – Competent person; excavation procedures; project specific protective system, including drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed.
29. Protection of Underground Facilities and Utilities Procedure, including responsible staff and responsibilities.
30. Concrete and Masonry Construction Procedures
31. Maintenance and Protection of Traffic Plan – Project specific MPT plan, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; flagmen training, public safety, etc.
32. Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person, fall protection plan, training requirements, etc.
33. Demolition – Engineering survey, including written evidence, disconnection of all effected utilities, identification of all hazardous chemicals, materials, gases, etc., floor openings, chutes, inspection and maintenance of all stairs/passageways, removal of materials/debris/structural elements, lock out/tag out, competent person.
34. Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
35. Stairways and Ladders – Types of stairs and ladders, safety procedures, training requirements.
36. Alcohol and Drug Abuse Policy
37. Rodents and Vermin Controls
38. Toxic and Hazardous Substances – Safety procedures for substances that Contractor's and subcontractor's employees can be exposed on project.
39. Noise Mitigation Plan – Completed project specific Noise Mitigation Plan, and noise mitigation procedures.
40. Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
41. Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site, procedures
42. Dust Mitigation Plan – Completed project specific Dust Mitigation Plan, and dust mitigation procedures.
43. Working Over and Near Water. Diving Operations – safety procedures including personal protective equipment, fall protection, rescue services, etc.

The most critical component of the Site Safety Plan is the Job Hazard Analysis (JHA) section. The JHA form is a written document prepared by the Contractor. The Contractor will conduct a site and task assessment to identify the tasks and any potential safety or environmental hazards related to performance of the work, eliminate or implement controls for the potential hazards, and identify proper personal protective equipment for the task. The JHA will be communicated to all Contractor/subcontractor personnel on site. The JHA will include safety hazard identification and controls to protect employees, general public, and property.

The initial JHA will be included in the Contractor's Site Safety Plan and the current JHA form will be available at the construction site for reference. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop and will be present at the worksite and produced upon request.

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

Prior to the start of construction activities on all DDC projects, RE will invite the Construction Safety Unit to the construction kick-off meeting. The Construction Safety Unit representative(s) will participate in this meeting with the Contractor and RE for the purpose of:

- A. Reviewing DDC Contract Safety Requirements
- B. Reviewing site-specific safety issues based on a project work scope, location, and any other factors which may impact safety of workers and general public.
- C. Reviewing the Site Safety Plan and JHA requirements.
- D. Reviewing Accident/Incident reporting and investigation procedures.
- E. Reviewing designated safety contacts, roles, and responsibilities.
- F. Discussing planned inspections and audits of the site by Construction Safety Unit 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) and the RE during regular inspections and comprehensive audits of the job site. Field Exit Conferences will be held with the RE and Contractor Project Safety Representatives.
- B. The RE will continually monitor the safety and environmental performance of the Contractor's employees and work methods. Deficiencies will be brought to the attention of the Contractor's Project Safety Representative on site for immediate correction. The RE will maintain a written record of these deficiencies and have these records available upon request. Any critical deficiencies will be immediately reported to the Construction Safety Unit via telephone (718)391-1911.
- C. If the Contractor's safety performance during the project is not up to DDC standards (safety performance measure, accident/incident rate, etc.) the Director – Construction Safety, or his/her designee will meet with the Contractor's Project Safety Representative and other representatives, the RE, and the DDC Environmental Specialist (if environmental issues are involved). The purpose of this meeting is to 1) determine the level of non-compliance; 2) explain and clarify the safety/environmental provisions; 3) agree on a future course of action to correct the deficiencies.
- D. If the deficiencies continue, the Commissioner may, without limitation, declare the Contractor in default.
- E. The Contractor will within 1 hour inform the RE of all accidents/incidents/near misses including all fatalities, any injuries to employees or members of the general public, and property damage (e.g., structural damage, equipment rollovers, utility damage, loads dropped from crane). The RE will notify the Construction Safety Unit as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure and will maintain a record of all Contractor accidents/incidents for the project.
- F. The Contractor and the RE will notify the Construction Safety Unit within two (2) hours of the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections.

## **IX. SAFETY PERFORMANCE EVALUATION**

The Contractor's safety record, including accident/incident history and DDC safety inspection results, will be considered as part of the Contractor's performance evaluation at the conclusion of the project. Poor safety performance during the course of the project will be a reason to rate a Contractor unsatisfactory which may be reflected in the City's PASSPort system and will be considered for future procurement actions as set forth in the City's Procurement Policy Board Rules.

**CITY OF NEW YORK**  
**STANDARD CONSTRUCTION CONTRACT**

**March 2017**

( NO TEXT ON THIS PAGE )

**CITY OF NEW YORK  
STANDARD CONSTRUCTION CONTRACT**

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**WITNESSETH:**

The parties, in consideration of the mutual agreements contained herein, agree as follows:

**CHAPTER I: THE CONTRACT AND DEFINITIONS**

**ARTICLE 1. THE CONTRACT**

1.1 Except for titles, subtitles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience), the following, except for such portions thereof as 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 fifteen (15) **Days** after the **Contractor** becomes aware or reasonably should be aware of each such condition, the **Contractor** must notify the **Resident Engineer** or **Engineer**, as directed by the **Commissioner**, in writing of the existence, nature and effect of such condition upon the approved progress schedule and the **Work**, and must state why and in what respects, if any, the condition is causing or may cause a delay. Such notice shall include a description of the construction activities that are or could be affected by the condition and may include any recommendations the **Contractor** may have to address the delay condition and any activities the **Contractor** may take to avoid or minimize the delay.

11.1.2 If the **Contractor** shall claim to be sustaining damages for delay as provided for in this Article 11, within forty-five (45) **Days** from the time such damages are first incurred for each such condition, the **Contractor** shall submit to the **Commissioner** a verified written statement of the details and estimates of the amounts of such damages, including categories of expected damages and projected monthly costs, together with documentary evidence of such damages as the **Contractor** may have at the time of submission ("statement of delay damages"), as further detailed in Article 11.6. The **Contractor** may submit the above statement within such additional time as may be granted by the **Commissioner** in writing upon written request therefor.

11.1.3 Articles 11.1.1 and 11.1.2 do not relieve the **Contractor** of its obligation to comply with the provisions of Article 44.

11.2 Failure of the **Contractor** to strictly comply with the requirements of Article 11.1.1 may, in the discretion of the **Commissioner**, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition. Failure of the **Contractor** to strictly comply with the requirements of both Articles 11.1.1 and 11.1.2 shall be deemed a conclusive waiver by the **Contractor** of any and all claims for damages for delay arising from such condition and no right to recover on such claims shall exist.

11.3 When appropriate and directed by the **Engineer**, the progress schedule shall be revised by the **Contractor** until finally approved by the **Engineer**. The revised progress schedule must be strictly adhered to by the **Contractor**.

11.4 Compensable Delays

11.4.1 The **Contractor** agrees to make claim only for additional costs attributable to delay in the performance of this **Contract** necessarily extending the time for completion of the **Work** or resulting from acceleration directed by the **Commissioner** and required to maintain the progress schedule, occasioned solely by any act or omission to act of the **City** listed below. The **Contractor** also agrees that delay from any other cause shall be

compensated, if at all, solely by an extension of time to complete the performance of the **Work**.

- 11.4.1.1 The failure of the **City** to take reasonable measures to coordinate and progress the **Work** to the extent required by the **Contract**, except that the **City** shall not be responsible for the **Contractor's** obligation to coordinate and progress the **Work** of its **Subcontractors**.
- 11.4.1.2 Unreasonable delays attributable to the review of shop drawings, the issuance of change orders, or the cumulative impact of change orders that were not brought about by any act or omission of the **Contractor**.
- 11.4.1.3 The unavailability of the **Site** caused by acts or omissions of the **City**.
- 11.4.1.4 The issuance by the **Engineer** of a stop work order that was not brought about through any act or omission of the **Contractor**.
- 11.4.1.5 Differing site conditions or environmental hazards that were neither known nor reasonably ascertainable on a pre-bid inspection of the **Site** or review of the bid documents or other publicly available sources, and that are not ordinarily encountered in the **Project's** geographical area or neighborhood or in the type of **Work** to be performed.
- 11.4.1.6 Delays caused by the **City's** bad faith or its willful, malicious, or grossly negligent conduct;
- 11.4.1.7 Delays not contemplated by the parties;
- 11.4.1.8 Delays so unreasonable that they constitute an intentional abandonment of the **Contract** by the **City**; and
- 11.4.1.9 Delays resulting from the **City's** breach of a fundamental obligation of the **Contract**.

11.4.2 No claim may be made for any alleged delay in **Substantial Completion** of the **Work** if the **Work** will be or is substantially completed by the date of **Substantial Completion** provided for in Schedule A unless acceleration has been directed by the **Commissioner** to meet the date of **Substantial Completion** set forth in Schedule A, or unless there is a provision in the **Contract** providing for additional compensation for early completion.

11.4.3 The provisions of this Article 11 apply only to claims for additional costs attributable to delay and do not preclude determinations by the **Commissioner** allowing reimbursements for additional costs for **Extra Work** pursuant to Articles 25 and 26 of this **Contract**. To the extent that any cost attributable to delay is reimbursed as part of a change order, no additional claim for compensation under this Article 11 shall be allowed.

11.5 Non-Compensable Delays. The **Contractor** agrees to make no claim for, and is deemed to have included in its bid prices for the various items of the **Contract**, the extra/additional costs attributable to any delays caused by or attributable to the items set forth below. For such items, the **Contractor** shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**, in accordance with the provisions of Article 13. Such extensions of time will be granted, if at all, pursuant to the grounds set forth in Article 13.3.

11.5.1 The acts or omissions of any third parties, including but not limited to **Other Contractors**, public/ governmental bodies (other than **City Agencies**), utilities or private enterprises, who are disclosed in the **Contract Documents** or are ordinarily encountered or generally recognized as related to the **Work**;

11.5.2 Any situation which was within the contemplation of the parties at the time of entering into the **Contract**, including any delay indicated or disclosed in the **Contract Documents** or that would be generally recognized by a reasonably prudent contractor as related to the nature of the **Work**, and/or the existence of any facility or appurtenance owned, operated or maintained by any third party, as indicated or disclosed in the **Contract Documents** or ordinarily encountered or generally recognized as related to the nature of the **Work**;

11.5.3 Restraining orders, injunctions or judgments issued by a court which were caused by a Contractor's submission, action or inaction or by a Contractor's **Means and Methods of Construction**, or by third parties, unless such order, injunction or judgment was the result of an act or omission by the **City**;

11.5.4 Any labor boycott, strike, picketing, lockout or similar situation;

11.5.5 Any shortages of supplies or materials, or unavailability of equipment, required by the **Contract Work**;

11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God, or acts of war or of the public enemy or terrorist acts, including the **City's** reasonable responses thereto; and

11.5.7 **Extra Work** which does not significantly affect the overall completion of the **Contract**, reasonable delays in the review or issuance of change orders or field orders and/or in shop drawing reviews or approvals.

#### 11.6 Required Content of Submission of Statement of Delay Damages

11.6.1 In the verified written statement of delay damages required by Article 11.1.2, the following information shall be provided by the **Contractor**:

11.6.1.1 For each delay, the start and end dates of the claimed periods of delay and, in addition, a description of the operations that were delayed, an explanation of how they were delayed, and the reasons for the delay, including identifying the applicable act or omission of the **City** listed in Article 11.4.

11.6.1.2 A detailed factual statement of the claim providing all necessary dates, locations and items of **Work** affected by the claim.

11.6.1.3 The estimated amount of additional compensation sought and a breakdown of that amount into categories as described in Article 11.7.

11.6.1.4 Any additional information requested by the **Commissioner**.

#### 11.7 Recoverable Costs

11.7.1 Delay damages may be recoverable for the following costs actually and necessarily incurred in the performance of the **Work**:

11.7.1.1 Direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits, based on time and materials records;

11.7.1.2 Necessary materials (including transportation to the **Site**), based on time and material records;

- 11.7.1.3 Reasonable rental value of necessary plant and equipment other than small tools, plus fuel/energy costs according to the applicable formula set forth in Articles 26.2.4 and/or 26.2.8, based on time and material records;
- 11.7.1.4 Additional insurance and bond costs;
- 11.7.1.5 Extended **Site** overhead, field office rental, salaries of field office staff, on-site project managers and superintendents, field office staff vehicles, **Project**-specific storage, field office utilities and telephone, and field office consumables;
- 11.7.1.6 Labor escalation costs based on actual costs;
- 11.7.1.7 Materials and equipment escalation costs based on applicable industry indices unless documentation of actual increased cost is provided;
- 11.7.1.8 Additional material and equipment storage costs based on actual documented costs and additional costs necessitated by extended manufacturer warranty periods; and
- 11.7.1.9 Extended home office overhead calculated based on the following formula:
  - (1) Subtract from the original **Contract** amount the amount earned by original contractual **Substantial Completion** date (not including change orders);
  - (2) Remove 15% overhead and profit from the calculation in item (1) by dividing the results of item (1) by 1.15;
  - (3) Multiply the result of item (2) by 7.25% for the total home office overhead;
  - (4) Multiply the result of item (3) by 7.25% for the total profit; and
  - (5) The total extended home office overhead will be the total of items (3) and (4).

11.7.2 Recoverable Subcontractor Costs. When the **Work** is performed by a **Subcontractor**, the **Contractor** may be paid the actual and necessary costs of such subcontracted **Work** as outlined above in Articles 11.7.1.1 through 11.7.1.8, and an additional overhead of 5% of the costs outlined in Articles 11.7.1.1 through 11.7.1.3.

11.7.3 Non-Recoverable Costs. The parties agree that the **City** will have no liability for the following items and the **Contractor** agrees it shall make no claim for the following items:

- 11.7.3.1 Profit, or loss of anticipated or unanticipated profit, except as provided in Article 11.7.1.9;
- 11.7.3.2 Consequential damages, including, but not limited to, construction or bridge loans or interest paid on such loans, loss of bonding capacity, bidding opportunities, or interest in investment, or any resulting insolvency;
- 11.7.3.3 Indirect costs or expenses of any nature except those included in Article 11.7.1;
- 11.7.3.4 Direct or indirect costs attributable to performance of **Work** where the **Contractor**, because of situations or conditions within its control, has not progressed the **Work** in a satisfactory manner; and
- 11.7.3.5 Attorneys' fees and dispute and claims preparation expenses.

- 11.8 Any claims for delay under this Article 11 are not subject to the jurisdiction of the Contract Dispute Resolution Board pursuant to the dispute resolution process set forth in Article 27.
- 11.9 Any compensation provided to the **Contractor** in accordance with this Article 11 will be made pursuant to a claim filed with the **Comptroller**. Nothing in this Article 11 extends the time for the **Contractor** to file an action with respect to a claim within six months after **Substantial Completion** pursuant to Article 56.

## **ARTICLE 12. COORDINATION WITH OTHER CONTRACTORS**

12.1 During the progress of the **Work**, **Other Contractors** may be engaged in performing other work or may be awarded other contracts for additional work on this **Project**. In that event, the **Contractor** shall coordinate the **Work** to be done hereunder with the work of such **Other Contractors** and the **Contractor** shall fully cooperate with such **Other Contractors** and carefully fit its own **Work** to that provided under other contracts as may be directed by the **Engineer**. The **Contractor** shall not commit or permit any act which will interfere with the performance of work by any **Other Contractors**.

12.2 If the **Engineer** determines that the **Contractor** is failing to coordinate its **Work** with the work of **Other Contractors** as the **Engineer** has directed, then the **Commissioner** shall have the right to withhold any payments otherwise due hereunder until the **Contractor** completely complies with the **Engineer's** directions.

12.3 The **Contractor** shall notify the **Engineer** in writing if any **Other Contractor** on this **Project** is failing to coordinate its work with the **Work** of this **Contract**. If the **Engineer** finds such charges to be true, the **Engineer** shall promptly issue such directions to the **Other Contractor** with respect thereto as the situation may require. The **City** shall not, however, be liable for any damages suffered by any **Other Contractor's** failure to coordinate its work with the **Work** of this **Contract** or by reason of the **Other Contractor's** failure to promptly comply with the directions so issued by the **Engineer**, or by reason of any **Other Contractor's** default in performance, it being understood that the **City** does not guarantee the responsibility or continued efficiency of any contractor. The **Contractor** agrees to make no claim against the **City** for any damages relating to or arising out of any directions issued by the **Engineer** pursuant to this Article 12 (including but not limited to the failure of any **Other Contractor** to comply or promptly comply with such directions), or the failure of any **Other Contractor** to coordinate its work, or the default in performance of any **Other Contractor**.

12.4 The **Contractor** shall indemnify and hold the **City** harmless from any and all claims or judgments for damages and from costs and expenses to which the **City** may be subjected or which it may suffer or incur by reason of the **Contractor's** failure to comply with the **Engineer's** directions promptly; and the **Comptroller** shall have the right to exercise the powers reserved in Article 23 with respect to any claims which may be made for damages due to the **Contractor's** failure to comply with the **Engineer's** directions promptly. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.5 Should the **Contractor** sustain any damage through any act or omission of any **Other Contractor** having a contract with the **City** for the performance of work upon the **Site** or of work which may be necessary to be performed for the proper prosecution of the **Work** to be performed hereunder, or through any act or omission of a subcontractor of such **Other Contractor**, the **Contractor** shall have no claim against the **City** for such damage, but shall have a right to recover such damage from the **Other**

**Contractor** under the provision similar to the following provisions which apply to this **Contract** and have been or will be inserted in the contracts with such **Other Contractors**:

12.5.1 Should any **Other Contractor** having or who shall hereafter have a contract with the **City** for the performance of work upon the **Site** sustain any damage through any act or omission of the **Contractor** hereunder or through any act or omission of any **Subcontractor** of the **Contractor**, the **Contractor** agrees to reimburse such **Other Contractor** for all such damages and to defend at its own expense any action based upon such claim and if any judgment or claim (even if the allegations of the action are without merit) against the **City** shall be allowed the **Contractor** shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and agrees to indemnify and hold the **City** harmless from all such claims. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.6 The **City's** right to indemnification hereunder shall in no way be diminished, waived or discharged by its recourse to assessment of liquidated damages as provided in Article 15, or by the exercise of any other remedy provided for by **Contract** or by **Law**.

### **ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE**

13.1 If performance by the **Contractor** is delayed for a reason set forth in Article 13.3, the **Contractor** may be allowed a reasonable extension of time in conformance with this Article 13 and the **PPB Rules**.

13.2 Any extension of time may be granted only by the **ACCO** or by the Board for the Extension of Time (hereafter "Board") (as set forth below) upon written application by the **Contractor**.

13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

13.3.1 By the acts or omissions of the **City**, its officials, agents or employees; or

13.3.2 By the act or omissions of **Other Contractors** on this **Project**; or

13.3.3 By supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, excessive inclement weather, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the **Contractor**).

13.3.4 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

13.4 The **Contractor** shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the **Work** as determined by the **ACCO** or the Board, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the **Contractor** or of its **Subcontractors** or **Materialmen**, and would of itself (irrespective

of the concurrent causes) have delayed the **Work**, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

13.5 The determination made by the **ACCO** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The **ACCO** or the Board acting entirely within their discretion may grant an application for an extension of time for causes of delay other than those herein referred.

13.7 Permitting the **Contractor** to continue with the **Work** after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the **Contractor** after such time, shall in no way operate as a waiver on the part of the **City** of any of its rights under this **Contract**.

13.8 Application for Extension of Time:

13.8.1 Before the **Contractor's** time extension request will be considered, the **Contractor** shall notify the **ACCO** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **ACCO** identifying:

13.8.1(a) The **Contractor**; the registration number; and **Project** description;

13.8.1(b) Liquidated damage assessment rate, as specified in the **Contract**;

13.8.1(c) Original total bid price;

13.8.1(d) The original **Contract** start date and completion date;

13.8.1(e) Any previous time extensions granted (number and duration); and

13.8.1(f) The extension of time requested.

13.8.2 In addition, the application for extension of time shall set forth in detail:

13.8.2(a) The nature of each alleged cause of delay in completing the **Work**;

13.8.2(b) The date upon which each such cause of delay began and ended and the number of **Days** attributable to each such cause;

13.8.2(c) A statement that the **Contractor** waives all claims except for those delineated in the application, and the particulars of any claims which the **Contractor** does not agree to waive. For time extensions for **Substantial Completion** and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and

13.8.2(d) A statement indicating the **Contractor's** understanding that the time extension is granted only for purposes of permitting continuation of **Contract** performance and payment for **Work** performed and that the **City** retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

13.9 Analysis and Approval of Time Extensions:

13.9.1 For time extensions for partial payments, a written determination shall be made by the **ACCO** who may, for good and sufficient cause, extend the time for the performance of the **Contract** as follows:

13.9.1(a) If the **Work** is to be completed within six (6) months, the time for performance may be extended for sixty (60) **Days**;

13.9.1(b) If the **Work** is to be completed within less than one (1) year but more than six (6) months, an extension of ninety (90) **Days** may be granted;

13.9.1(c) If the **Contract** period exceeds one (1) year, besides the extension granted in Article 13.9.1(b), an additional thirty (30) **Days** may be granted for each multiple of six (6) months involved beyond the one (1) year period; or

13.9.1(d) If exceptional circumstances exist, the **ACCO** may extend the time for performance beyond the extensions in Articles 13.9.1(a), 13.9.1(b), and 13.9.1(c). In that event, the **ACCO** shall file with the Mayor's Office of Contract Services a written explanation of the exceptional circumstances.

13.9.2 For extensions of time for **Substantial Completion** and final completion payments, the **Engineer**, in consultation with the **ACCO**, shall prepare a written analysis of the delay (including a preliminary determination of the causes of delay, the beginning and end dates for each such cause of delay, and whether the delays are excusable under the terms of this **Contract**). The report shall be subject to review by and approval of the Board, which shall have authority to question its analysis and determinations and request additional facts or documentation. The report as reviewed and made final by the Board shall be made a part of the **Agency** contract file. Neither the report itself nor anything contained therein shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

13.9.3 Approval Mechanism for Time Extensions for **Substantial Completion** or Final Completion Payments: An extension shall be granted only with the approval of the Board which is comprised of the **ACCO** of the **Agency**, the **City** Corporation Counsel, and the **Comptroller**, or their authorized representatives.

13.9.4 Neither the granting of any application for an extension of time to the **Contractor** or any **Other Contractor** on this **Project** nor the papers, records or reports related to any application for or grant of an extension of time or determination related thereto shall be referred to or offered in evidence by the **Contractor** or its attorneys in any action or proceeding.

13.10 No Damage for Delay: The **Contractor** agrees to make no claim for damages for delay in the performance of this **Contract** occasioned by any act or omission to act of the **City** or any of its representatives, except as provided for in Article 11.

#### **ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK**

14.1 Date for **Substantial Completion**: The **Contractor** shall substantially complete the **Work** within the time fixed in Schedule A of the General Conditions, or within the time to which such **Substantial Completion** may be extended.

14.2 Determining the Date of **Substantial Completion**: The **Work** will be deemed to be substantially complete when the two conditions set forth below have been met.

14.2.1 Inspection: The **Engineer** or **Resident Engineer**, as applicable, has inspected the **Work** and has made a written determination that it is substantially complete.

14.2.2 Approval of **Final Approved Punch List** and Date for **Final Acceptance**: Following inspection of the **Work**, the **Engineer/Resident Engineer** shall furnish the **Contractor** with a final punch list, specifying all items of **Work** to be completed and proposing dates for the completion of each specified item of **Work**. The **Contractor** shall then submit in writing to the **Engineer/Resident Engineer** within ten (10) **Days** of the **Engineer/Resident Engineer** furnishing the final punch list either acceptance of the dates or proposed alternative dates for the completion of each specified item of **Work**. If the **Contractor** neither accepts the dates nor proposes alternative dates within ten (10) **Days**, the schedule proposed by the **Engineer/Resident Engineer** shall be deemed accepted. If the **Contractor** proposes alternative dates, then, within a reasonable time after receipt, the **Engineer/Resident Engineer**, in a written notification to the **Contractor**, shall approve the **Contractor's** completion dates or, if they are unable to agree, the **Engineer/Resident Engineer** shall establish dates for the completion of each item of **Work**. The latest completion date specified shall be the date for **Final Acceptance** of the **Work**.

14.3 Date of **Substantial Completion**. The date of approval of the **Final Approved Punch List**, shall be the date of **Substantial Completion**. The date of approval of the **Final Approved Punch List** shall be either (a) if the **Contractor** approves the final punch list and proposed dates for completion furnished by the **Engineer/Resident Engineer**, the date of the **Contractor's** approval; or (b) if the **Contractor** neither accepts the dates nor proposes alternative dates, ten (10) **Days** after the **Engineer/Resident Engineer** furnishes the **Contractor** with a final punch list and proposed dates for completion; or (c) if the **Contractor** proposes alternative dates, the date that the **Engineer/Resident Engineer** sends written notification to the **Contractor** either approving the **Contractor's** proposed alternative dates or establishing dates for the completion for each item of **Work**.

14.4 Determining the Date of **Final Acceptance**: The **Work** will be accepted as final and complete as of the date of the **Engineer's/Resident Engineer's** inspection if, upon such inspection, the **Engineer/Resident Engineer** finds that all items on the **Final Approved Punch List** are complete and no further **Work** remains to be done. The **Commissioner** will then issue a written determination of **Final Acceptance**.

14.5 Request for Inspection: Inspection of the **Work** by the **Engineer/Resident Engineer** for the purpose of **Substantial Completion** or **Final Acceptance** shall be made within fourteen (14) **Days** after receipt of the **Contractor's** written request therefor.

14.6 Request for Re-inspection: If upon inspection for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** determines that there are items of **Work** still to be performed, the **Contractor** shall promptly perform them and then request a re-inspection. If upon re-inspection, the **Engineer/Resident Engineer** determines that the **Work** is substantially complete or finally accepted, the date of such re-inspection shall be the date of **Substantial Completion** or **Final Acceptance**. Re-inspection by the **Engineer/Resident Engineer** shall be made within ten (10) **Days** after receipt of the **Contractor's** written request therefor.

14.7 Initiation of Inspection by the **Engineer/Resident Engineer**: If the **Contractor** does not request inspection or re-inspection of the **Work** for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** may initiate such inspection or re-inspection.

#### **ARTICLE 15. LIQUIDATED DAMAGES**

15.1 In the event the **Contractor** fails to substantially complete the **Work** within the time fixed for such **Substantial Completion** in Schedule A of the General Conditions, plus authorized time extensions, or if the **Contractor**, in the sole determination of the **Commissioner**, has abandoned the **Work**, the **Contractor** shall pay to the **City** the sum fixed in Schedule A of the General Conditions, for each and every **Day** that the time consumed in substantially completing the **Work** exceeds the time allowed therefor; which said sum, in view of the difficulty of accurately ascertaining the loss which the **City** will suffer by reason of delay in the **Substantial Completion** of the **Work** hereunder, is hereby fixed and agreed as the liquidated damages that the **City** will suffer by reason of such delay, and not as a penalty. This Article 15 shall also apply to the **Contractor** whether or not the **Contractor** is defaulted pursuant to Chapter X of this **Contract**. Neither the failure to assess liquidated damages nor the granting of any time extension shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

15.2 Liquidated damages received hereunder are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the **City's** right to indemnification, or the **Contractor's** obligation to indemnify the **City**, or to any other remedy provided for in this **Contract** or by **Law**.

15.3 The **Commissioner** may deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the **City**, the **Contractor** shall be liable to pay the difference.

#### **ARTICLE 16. OCCUPATION OR USE PRIOR TO COMPLETION**

16.1 Unless otherwise provided for in the **Specifications**, the **Commissioner** may take over, use, occupy or operate any part of the **Work** at any time prior to **Final Acceptance**, upon written notification to the **Contractor**. The **Engineer** or **Resident Engineer**, as applicable, shall inspect the part of the **Work** to be taken over, used, occupied, or operated, and will furnish the **Contractor** with a written statement of the **Work**, if any, which remains to be performed on such part. The **Contractor** shall not object to, nor interfere with, the **Commissioner's** decision to exercise the rights granted by Article 16. In the event the **Commissioner** takes over, uses, occupies, or operates any part of the **Work**:

16.1.1 the **Engineer/Resident Engineer** shall issue a written determination of **Substantial Completion** with respect to such part of the **Work**;

16.1.2 the **Contractor** shall be relieved of its absolute obligation to protect such part of the unfinished **Work** in accordance with Article 7;

16.1.3 the **Contractor's** guarantee on such part of the **Work** shall begin on the date of such use by the **City**; and;

16.1.4 the **Contractor** shall be entitled to a return of so much of the amount retained in accordance with Article 21 as it relates to such part of the **Work**, except so much thereof as may be retained under Articles 24 and 44.

## CHAPTER IV: SUBCONTRACTS AND ASSIGNMENTS

### ARTICLE 17. SUBCONTRACTS

17.1 The **Contractor** shall not make subcontracts totaling an amount more than the percentage of the total **Contract** price fixed in Schedule A of the General Conditions, without prior written permission from the **Commissioner**. All subcontracts made by the **Contractor** shall be in writing. No **Work** may be performed by a **Subcontractor** prior to the **Contractor** entering into a written subcontract with the **Subcontractor** and complying with the provisions of this Article 17.

17.2 Before making any subcontracts, the **Contractor** shall submit a written statement to the **Commissioner** giving the name and address of the proposed **Subcontractor**; the portion of the **Work** and materials which it is to perform and furnish; the cost of the subcontract; the VENDEX questionnaire if required; the proposed subcontract if requested by the **Commissioner**; and any other information tending to prove that the proposed **Subcontractor** has the necessary facilities, skill, integrity, past experience, and financial resources to perform the **Work** in accordance with the terms and conditions of this **Contract**.

17.3 In addition to the requirements in Article 17.2, **Contractor** is required to list the **Subcontractor** in the web based Subcontractor Reporting System through the City's Payee Information Portal (PIP), available at [www.nyc.gov/pip](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.

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

<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).

**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, the **Contractor** shall provide Commercial General Liability Insurance with limits of at least those required by 1 RCNY section 101-08 or greater limits required by the Agency in accordance with Schedule A. If the **Work** does not require such a permit, the minimum limits shall be those provided for in Schedule A.

22.1.1(d) If any of the **Work** includes repair of a waterborne vessel owned by or to be delivered to the **City**, such Commercial General Liability shall include, or be endorsed to include, Ship Repairer's Legal Liability Coverage to protect against, without limitation, liability arising from navigation of such vessels prior to delivery to and acceptance by the **City**.

22.1.2 Workers' Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance: The **Contractor** shall provide, and shall cause its **Subcontractors** to provide, Workers Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance in accordance with the **Laws** of the State of New York on behalf of all employees providing services under this **Contract** (except for those employees, if any, for which the **Laws** require insurance only pursuant to Article 22.1.3).

22.1.3 United States Longshoremen's and Harbor Workers Act and/or Jones Act Insurance: If specified in Schedule A of the General Conditions or if required by **Law**, the **Contractor** shall provide insurance in accordance with the United States Longshoremen's and Harbor Workers Act and/or the Jones Act, on behalf of all qualifying employees providing services under this **Contract**.

22.1.4 Builders Risk Insurance: If specified in Schedule A of the General Conditions, the **Contractor** shall provide Builders Risk Insurance on a completed value form for the total value of the **Work** through **Substantial Completion** of the **Work** in its entirety. Such insurance shall be provided on an All Risk basis and include coverage, without limitation, for windstorm (including named windstorm), storm surge, flood and earth movement. Unless waived by the **Commissioner**, it shall include coverage for ordinance and law, demolition and increased costs of construction, debris removal, pollutant clean up and removal, and expediting costs. Such insurance shall cover, without limitation, (a) all buildings and/or structures involved in the **Work**, as well as temporary structures at the **Site**, and (b) any property that is intended to become a permanent part of such building or structure, whether such property is on the **Site**, in transit or in temporary storage. Policies shall name the **Contractor** as Named Insured and list the **City** as both an Additional Insured and a Loss Payee as its interest may appear.

22.1.4(a) Policies of such insurance shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company.

22.1.4(b) Such insurance may be provided through an Installation Floater, at the **Contractor's** option, if it otherwise conforms with the requirements of this Article 22.1.4.

22.1.5 Commercial Automobile Liability Insurance: The **Contractor** shall provide Commercial Automobile Liability Insurance for liability arising out of ownership,

maintenance or use of any owned (if any), non-owned and hired vehicles to be used in connection with this **Contract**. Coverage shall be at least as broad as the latest edition of ISO Form CA0001. If vehicles are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90.

22.1.6 Contractors Pollution Liability Insurance: If specified in Schedule A of the General Conditions, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Contractors Pollution Liability Insurance covering bodily injury and property damage. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos) or in the investigation, settlement or defense of any claim, action, or proceedings arising from the operations under this **Contract**. Such insurance shall be in the **Contractor's** name and list the **City** as an Additional Insured and any other entity specified in Schedule A. Coverage shall include, without limitation, (a) loss of use of damaged property or of property that has not been physically injured, (b) transportation, and (c) non-owned disposal sites.

22.1.6(a) Coverage for the **City** as Additional Insured shall specifically include the **City's** officials and employees and be at least as broad as provided to the **Contractor** for this **Project**.

22.1.6(b) If such insurance is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this **Contract**, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three (3) years from the time the **Work** under this **Contract** is completed.

22.1.7 Marine Insurance:

22.1.7(a) Marine Protection and Indemnity Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Marine Protection and Indemnity Insurance with coverage at least as broad as Form SP-23. The insurance shall provide coverage for the **Contractor** or **Subcontractor** (whichever is doing this **Work**) and for the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured for bodily injury and property damage arising from marine operations under this **Contract**. Coverage shall include, without limitation, injury or death of crew members (if not fully provided through other insurance), removal of wreck, damage to piers, wharves and other fixed or floating objects and loss of or damage to any other vessel or craft, or to property on such other vessel or craft.

22.1.7(b) Hull and Machinery Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Hull and Machinery Insurance with coverage for the **Contractor** or **Subcontractor** (whichever is doing this **Work**) and for the **City** (together with its officials and employees) as Additional Insured at least as broad as the latest edition of American Institute Tug Form for all tugs used under this

**Contract** and Collision Liability at least as broad as the latest edition of American Institute Hull Clauses.

22.1.7(c) Marine Pollution Liability Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such Work to maintain, Marine Pollution Liability Insurance covering itself (or the Subcontractor doing such Work) as Named Insured and the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured. Coverage shall be at least as broad as that provided by the latest edition of Water Quality Insurance Syndicate Form and include, without limitation, liability arising from the discharge or substantial threat of a discharge of oil, or from the release or threatened release of a hazardous substance including injury to, or economic losses resulting from, the destruction of or damage to real property, personal property or natural resources.

22.1.8 The **Contractor** shall provide such other types of insurance, at such minimum limits and with such conditions, as are specified in Schedule A of the General Conditions.

22.2 General Requirements for Insurance Coverage and Policies:

22.2.1 All required insurance policies shall be maintained with companies that may lawfully issue the required policy and have an A.M. Best rating of at least A-/VII or a Standard and Poor's rating of at least A, unless prior written approval is obtained from the **City** Corporation Counsel.

22.2.2 The **Contractor** shall be solely responsible for the payment of all premiums for all required policies and all deductibles and self-insured retentions to which such policies are subject, whether or not the **City** is an insured under the policy.

22.2.3 In his/her sole discretion, the **Commissioner** may, subject to the approval of the **Comptroller** and the **City** Corporation Counsel, accept Letters of Credit and/or custodial accounts in lieu of required insurance.

22.2.4 The **City's** limits of coverage for all types of insurance required pursuant to Schedule A of the General Conditions shall be the greater of (i) the minimum limits set forth in Schedule A or (ii) the limits provided to the **Contractor** as Named Insured under all primary, excess, and umbrella policies of that type of coverage.

22.2.5 The **Contractor** may satisfy its insurance obligations under this Article 22 through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein.

22.2.6 Policies of insurance provided pursuant to this Article 22 shall be primary and non-contributing to any insurance or self-insurance maintained by the **City**.

22.3 Proof of Insurance:

22.3.1 For all types of insurance required by Article 22.1 and Schedule A, except for insurance required by Articles 22.1.4 and 22.1.7, the **Contractor** shall file proof of insurance in accordance with this Article 22.3 within ten (10) **Days** of award. For insurance

provided pursuant to Articles 22.1.4 and 22.1.7, proof shall be filed by a date specified by the **Commissioner** or ten (10) **Days** prior to the commencement of the portion of the **Work** covered by such policy, whichever is earlier.

22.3.2 For Workers' Compensation Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers' Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. For Disability Benefits Insurance provided pursuant to Article 22.1.2, the Contractor shall submit DB-120.1 - Certificate Of Insurance Coverage Under The NYS Disability Benefits Law, Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. ACORD forms are not acceptable.

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the **City** and any other entity specified in Schedule A is an Additional Insured thereunder; (c) in the event insurance is required pursuant to Article 22.1.6 and/or Article 22.1.7, that the **City** is an Additional Insured thereunder; (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number); and (e) the number assigned to the **Contract** by the **City**. All such Certificates of Insurance shall be accompanied by either a duly executed "Certification by Insurance Broker or Agent" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

22.3.4 Documentation confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such proofs of insurance shall comply with the requirements of Articles 22.3.2 and 22.3.3.

22.3.5 The **Contractor** shall be obligated to provide the **City** with a copy of any policy of insurance provided pursuant to this Article 22 upon the demand for such policy by the **Commissioner** or the **City** Corporation Counsel.

#### 22.4 Operations of the **Contractor**:

22.4.1 The **Contractor** shall not commence the **Work** unless and until all required certificates have been submitted to and accepted by the **Commissioner**. Acceptance by the **Commissioner** of a certificate does not excuse the **Contractor** from securing insurance consistent with all provisions of this Article 22 or of any liability arising from its failure to do so.

22.4.2 The **Contractor** shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by this **Contract** and shall be authorized to perform **Work** only during the effective period of all required coverage.

22.4.3 In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the **Contractor** shall immediately stop all **Work**, and shall not recommence **Work** until authorized in writing to do so by the **Commissioner**. Upon quitting the **Site**, except as otherwise directed by the **Commissioner**, the **Contractor** shall leave all plant, materials, equipment, tools, and supplies on the **Site**. **Contract** time shall continue to run during such periods and no extensions of time will be granted. The **Commissioner** may also declare the **Contractor** in default for failure to maintain required insurance.

22.4.4 In the event the **Contractor** receives notice, from an insurance company or other person, that any insurance policy required under this Article 22 shall be cancelled or terminated (or has been cancelled or terminated) for any reason, the **Contractor** shall immediately forward a copy of such notice to both the **Commissioner** and the New York City Comptroller, attn: Office of Contract Administration, Municipal Building, One Centre Street, room 1005, New York, New York 10007. Notwithstanding the foregoing, the **Contractor** shall ensure that there is no interruption in any of the insurance coverage required under this Article 22.

22.4.5 Where notice of loss, damage, occurrence, accident, claim or suit is required under an insurance policy maintained in accordance with this Article 22, the **Contractor** shall notify in writing all insurance carriers that issued potentially responsive policies of any such event relating to any operations under this **Contract** (including notice to Commercial General Liability insurance carriers for events relating to the **Contractor**'s own employees) no later than 20 days after such event. For any policy where the **City** is an Additional Insured, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Insured as well as the Named Insured." Such notice shall also contain the following information: the number of the insurance policy, the name of the named insured, the date and location of the damage, occurrence, or accident, and the identity of the persons or things injured, damaged or lost. The **Contractor** shall simultaneously send a copy of such notice to the City of New York c/o Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

22.4.6 In the event of any loss, accident, claim, action, or other event that does or can give rise to a claim under any insurance policy required under this Article 22, the **Contractor** shall at all times fully cooperate with the **City** with regard to such potential or actual claim.

22.5 **Subcontractor Insurance:** In the event the **Contractor** requires any **Subcontractor** to procure insurance with regard to any operations under this **Contract** and requires such **Subcontractor** to name the **Contractor** as an **Additional Insured** thereunder, the **Contractor** shall ensure that the **Subcontractor** name the **City**, including its officials and employees, as an Additional Insured with coverage at least as broad as the most recent edition of ISO Form CG 20 26.

22.6 Wherever reference is made in Article 7 or this Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents shall be sent to the address set forth in Schedule A of the General Conditions. In the event no address is set forth in Schedule A, such documents are to be sent to the **Commissioner**'s address as provided elsewhere in this **Contract**.

22.7 Apart from damages or losses covered by insurance provided pursuant to Articles 22.1.2, 22.1.3, or 22.1.5, the **Contractor** waives all rights against the **City**, including its officials and employees, for any damages or losses that are covered under any insurance required under this Article 22 (whether or

not such insurance is actually procured or claims are paid thereunder) or any other insurance applicable to the operations of the **Contractor** and/or its employees, agents, or **Subcontractors**.

22.8 In the event the **Contractor** utilizes a self-insurance program to satisfy any of the requirements of this Article 22, the **Contractor** shall ensure that any such self-insurance program provides the **City** with all rights that would be provided by traditional insurance under this Article 22, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

22.9 Materiality/Non-Waiver: The **Contractor's** failure to secure policies in complete conformity with this Article 22, or to give an insurance company timely notice of any sort required in this **Contract** or to do anything else required by this Article 22 shall constitute a material breach of this **Contract**. Such breach shall not be waived or otherwise excused by any action or inaction by the **City** at any time.

22.10 Pursuant to General Municipal Law Section 108, this **Contract** shall be void and of no effect unless **Contractor** maintains Workers' Compensation Insurance for the term of this **Contract** to the extent required and in compliance with the New York State Workers' Compensation Law.

22.11 Other Remedies: Insurance coverage provided pursuant to this Article 22 or otherwise shall not relieve the **Contractor** of any liability under this **Contract**, nor shall it preclude the **City** from exercising any rights or taking such other actions available to it under any other provisions of this **Contract** or **Law**.

### ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If any claim shall be made by any person or entity (including **Other Contractors** with the **City** on this **Project**) against the **City** or against the **Contractor** and the **City** for any of the following:

(a) An alleged loss, damage, injury, theft or vandalism of any of the kinds referred to in Articles 7 and 12, plus the reasonable costs of defending the **City**, which in the opinion of the **Comptroller** may not be paid by an insurance company (for any reason whatsoever); or

(b) An infringement of copyrights, patents or use of patented articles, tools, etc., as referred to in Article 57; or

(c) Damage claimed to have been caused directly or indirectly by the failure of the **Contractor** to perform the **Work** in strict accordance with this **Contract**,

the amount of such claim, or so much thereof as the **Comptroller** may deem necessary, may be withheld by the **Comptroller**, as security against such claim, from any money due hereunder. The **Comptroller**, in his/her discretion, may permit the **Contractor** to substitute other satisfactory security in lieu of the monies so withheld.

23.2 If an action on such claim is timely commenced and the liability of the **City**, or the **Contractor**, or both, shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the **Contractor** to be valid, the **Comptroller** shall pay such judgment or admitted claim out of the monies retained by the **Comptroller** under the provisions of this Article 23, and return the balance, if any, without interest, to the **Contractor**.

## ARTICLE 24. MAINTENANCE AND GUARANTY

24.1 The **Contractor** shall promptly repair, replace, restore or rebuild, as the **Commissioner** may determine, any finished **Work** in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of **Substantial Completion** (or use and occupancy in accordance with Article 16), except where other periods of maintenance and guaranty are provided for in Schedule A.

24.2 As security for the faithful performance of its obligations hereunder, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to one (1%) percent of the price (or the amount fixed in Schedule A of the General Conditions) in cash or certified check upon a state or national bank and trust company or a check of such bank and trust company signed by a duly authorized officer thereof and drawn to the order of the **Comptroller**, or obligations of the **City**, which the **Comptroller** may approve as of equal value with the sum so required.

24.3 In lieu of the above, the **Contractor** may make such security payment to the **City** by authorizing the **Commissioner** in writing to deduct the amount from the **Substantial Completion** payment which shall be deemed the deposit required above.

24.4 If the **Contractor** has faithfully performed all of its obligations hereunder the **Commissioner** shall so certify to the **Comptroller** within five (5) **Days** after the expiration of one (1) year from the date of **Substantial Completion** and acceptance of the **Work** or within thirty (30) **Days** after the expiration of the guarantee period fixed in the **Specifications**. The security payment shall be repaid to the **Contractor** without interest within thirty (30) **Days** after certification by the **Commissioner** to the **Comptroller** that the **Contractor** has faithfully performed all of its obligations hereunder.

24.5 Notice by the **Commissioner** to the **Contractor** to repair, replace, rebuild or restore such defective or damaged **Work** shall be timely, pursuant to this article, if given not later than ten (10) **Days** subsequent to the expiration of the one (1) year period or other periods provided for herein.

24.6 If the **Contractor** shall fail to repair, replace, rebuild or restore such defective or damaged **Work** promptly after receiving such notice, the **Commissioner** shall have the right to have the **Work** done by others in the same manner as provided for in the completion of a defaulted **Contract**, under Article 51.

24.7 If the security payment so deposited is insufficient to cover the cost of such **Work**, the **Contractor** shall be liable to pay such deficiency on demand by the **Commissioner**.

24.8 The **Engineer's** certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective **Work** when performed by one other than the **Contractor**, shall be binding and conclusive upon the **Contractor** as to the amount thereof.

24.9 The **Contractor** shall obtain all manufacturers' warranties and guaranties of all equipment and materials required by this **Contract** in the name of the **City** and shall deliver same to the **Commissioner**. All of the **City's** rights and title and interest in and to said manufacturers' warranties and guaranties may be assigned by the **City** to any subsequent purchasers of such equipment and materials or lessees of the premises into which the equipment and materials have been installed.

## CHAPTER VI: CHANGES, EXTRA WORK, AND DOCUMENTATION OF CLAIM

### ARTICLE 25. CHANGES

25.1 Changes may be made to this **Contract** only as duly authorized in writing by the **Commissioner** in accordance with the **Law** and this **Contract**. All such changes, modifications, and amendments will become a part of the **Contract**. **Work** so ordered shall be performed by the **Contractor**.

25.2 **Contract** changes will be made only for **Work** necessary to complete the **Work** included in the original scope of the **Contract** and/or for non-material changes to the scope of the **Contract**. Changes are not permitted for any material alteration in the scope of **Work** in the **Contract**.

25.3 The **Contractor** shall be entitled to a price adjustment for **Extra Work** performed pursuant to a written change order. Adjustments to price shall be computed in one or more of the following ways:

25.3.1 By applicable unit prices specified in the **Contract**; and/or

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

25.3.4 In any other manner approved by the **CCPO**.

25.4 All payments for change orders are subject to pre-audit by the **Engineering Audit Officer** and may be post-audited by the **Comptroller** and/or the **Agency**.

### ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

26.1 **Overrun of Unit Price Item:** An overrun is any quantity of a unit price item which the **Contractor** is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

26.1.1 For any unit price item, the **Contractor** will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the **Work**, the actual quantity of any unit price item required to complete the **Work** approaches the estimated quantity for that item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the **Work** will exceed the estimated quantity for that item by twenty-five (25%) percent, the **Contractor** shall immediately notify the **Engineer** of such anticipated overrun. The **Contractor** shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the **Engineer**.

26.1.2 If the actual quantity of any unit price item necessary to complete the **Work** will exceed one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the **City** reserves the right and the **Contractor** agrees to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the **City** and **Contractor** cannot agree on a new unit price, then the **City** shall order the **Contractor** and the **Contractor** agrees to provide additional quantities of

the item on the basis of time and material records for the actual and reasonable cost as determined under Article 26.2, but in no event at a unit price exceeding the unit price bid.

**26.2 Extra Work:** For **Extra Work** where payment is by agreement on a fixed price in accordance with Article 25.3.2, the price to be paid for such **Extra Work** shall be based on the fair and reasonable estimated cost of the items set forth below. For **Extra Work** where payment is based on time and material records in accordance with Article 25.3.3, the price to be paid for such **Extra Work** shall be the actual and reasonable cost of the items set forth below, calculated in accordance with the formula specified therein, if any.

26.2.1 Necessary materials (including transportation to the **Site**); plus

26.2.2 Necessary direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits; plus

26.2.3 Sales and personal property taxes, if any, required to be paid on materials not incorporated into such **Extra Work**; plus

26.2.4 Reasonable rental value of **Contractor**-owned (or **Subcontractor**-owned, as applicable), necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour:  $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$ . Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by Equipment Watch (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable), as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment (scaffolding, sheeting systems, road plates, etc.), the **City** may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

26.2.5 Necessary installation and dismantling of such plant and equipment, including transportation to and from the **Site**, if any, provided that, in the case of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) equipment rented from a third party, the cost of installation and dismantling are not allowable if such costs are included in the rental rate; plus

26.2.6 Necessary fees charged by governmental entities; plus

26.2.7 Necessary construction-related service fees charged by non-governmental entities, such as landfill tipping fees; plus

26.2.8 Reasonable rental costs of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per hour of operation:  $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$ . In lieu of renting, the **City** reserves the right to direct the purchase of non-operating equipment (scaffolding, sheeting systems, road plates, etc.), with payment on a purchase-salvage/life cycle basis, if less than the projected rental costs; plus

26.2.9 Workers' Compensation Insurance, and any insurance coverage expressly required by the **City** for the performance of the **Extra Work** which is different than the types of insurance required by Article 22 and Schedule A of the General Conditions. The cost of Workers' Compensation Insurance is subject to applicable payroll limitation caps and shall be based upon the carrier's Manual Rate for such insurance derived from the applicable class Loss Cost ("LC") and carrier's Lost Cost Multiplier ("LCM") approved by the New York State Department of Financial Services, and with the exception of experience rating, rate modifiers as promulgated by the New York Compensation Insurance Rating Board ("NYCIRB"); plus

26.2.10 Additional costs incurred as a result of the **Extra Work** for performance and payment bonds; plus

26.2.11 Twelve percent (12%) percent of the total of items in Articles 26.2.1 through 26.2.5 as compensation for overhead, except that no percentage for overhead will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes. Overhead shall include without limitation, all costs and expenses in connection with administration, management superintendence, small tools, and insurance required by Schedule A of the General Conditions other than Workers' Compensation Insurance; plus

26.2.12 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus the items in Article 26.2.11, as compensation for profit, except that no percentage for profit will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes; plus

26.2.13 Five (5%) percent of the total of items in Articles 26.2.6 through 26.2.10 as compensation for overhead and profit.

26.3 Where the **Extra Work** is performed in whole or in part by other than the **Contractor's** own forces pursuant to Article 26.2, the **Contractor** shall be paid, subject to pre-audit by the **Engineering Audit Officer**, the cost of such **Work** computed in accordance with Article 26.2 above, plus an additional allowance of five (5%) percent to cover the **Contractor's** overhead and profit.

26.4 Where a change is ordered, involving both **Extra Work** and omitted or reduced **Contract Work**, the **Contract** price shall be adjusted, subject to pre-audit by the **EAO**, in an amount based on the difference between the cost of such **Extra Work** and of the omitted or reduced **Work**.

26.5 Where the **Contractor** and the **Commissioner** can agree upon a fixed price for **Extra Work** in accordance with Article 25.3.2 or another method of payment for **Extra Work** in accordance with

Article 25.3.4, or for **Extra Work** ordered in connection with omitted **Work**, such method, subject to pre-audit by the **EAO**, may, at the option of the **Commissioner**, be substituted for the cost plus a percentage method provided in Article 26.2; provided, however, that if the **Extra Work** is performed by a **Subcontractor**, the **Contractor** shall not be entitled to receive more than an additional allowance of five (5%) percent for overhead and profit over the cost of such **Subcontractor's Work** as computed in accordance with Article 26.2.

## ARTICLE 27. RESOLUTION OF DISPUTES

27.1 All disputes between the **City** and the **Contractor** of the kind delineated in this Article 27.1 that arise under, or by virtue of, this **Contract** shall be finally resolved in accordance with the provisions of this Article 27 and the **PPB Rules**. This procedure for resolving all disputes of the kind delineated herein shall be the exclusive means of resolving any such disputes.

27.1.1 This Article 27 shall not apply to disputes concerning matters dealt with in other sections of the **PPB Rules**, or to disputes involving patents, copyrights, trademarks, or trade secrets (as interpreted by the courts of New York State) relating to proprietary rights in computer software.

27.1.2 This Article 27 shall apply only to disputes about the scope of **Work** delineated by the **Contract**, the interpretation of **Contract** documents, the amount to be paid for **Extra Work** or disputed work performed in connection with the **Contract**, the conformity of the **Contractor's Work** to the **Contract**, and the acceptability and quality of the **Contractor's Work**; such disputes arise when the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** makes a determination with which the **Contractor** disagrees.

27.2 All determinations required by this Article 27 shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented to the party making the determination. Failure to make such determination within the time required by this Article 27 shall be deemed a non-determination without prejudice that will allow application to the next level.

27.3 During such time as any dispute is being presented, heard, and considered pursuant to this Article 27, the **Contract** terms shall remain in force and the **Contractor** shall continue to perform **Work** as directed by the **ACCO** or the **Engineer**. Failure of the **Contractor** to continue **Work** as directed shall constitute a waiver by the **Contractor** of its claim.

### 27.4 Presentation of Disputes to **Commissioner**.

Notice of Dispute and Agency Response. The **Contractor** shall present its dispute in writing ("Notice of Dispute") to the **Commissioner** within thirty (30) Days of receiving written notice of the determination or action that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the **Contract**. The Notice of Dispute shall include all the facts, evidence, documents, or other basis upon which the **Contractor** relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the **Contractor** in the dispute was arrived at. Within thirty (30) Days after receipt of the detailed written submission comprising the complete Notice of Dispute, the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** shall submit to the **Commissioner** all materials he or she deems pertinent to the dispute. Following initial submissions to the **Commissioner**, either party may demand of the other the production of any document or other material the demanding party believes may be relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise

protected by a legal privilege recognized by the courts of New York State. Any question of relevancy shall be determined by the **Commissioner** whose decision shall be final. Willful failure of the **Contractor** to produce any requested material whose relevancy the **Contractor** has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the **Contractor** of its claim.

27.4.1 **Commissioner Inquiry.** The **Commissioner** shall examine the material and may, in his or her discretion, convene an informal conference with the **Contractor**, the **ACCO**, and the **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner** to resolve the issue by mutual consent prior to reaching a determination. The **Commissioner** may seek such technical or other expertise as he or she shall deem appropriate, including the use of neutral mediators, and require any such additional material from either or both parties as he or she deems fit. The **Commissioner's** ability to render, and the effect of, a decision hereunder shall not be impaired by any negotiations in connection with the dispute presented, whether or not the **Commissioner** participated therein. The **Commissioner** may or, at the request of any party to the dispute, shall compel the participation of any **Other Contractor** with a contract related to the **Work** of this **Contract**, and that **Contractor** shall be bound by the decision of the **Commissioner**. Any **Other Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this Article 27 as the **Contractor** initiating the dispute.

27.4.2 **Commissioner Determination.** Within thirty (30) **Days** after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the **Commissioner** shall make his or her determination and shall deliver or send a copy of such determination to the **Contractor**, the **ACCO**, and **Engineer, Resident Engineer, Engineering Audit Officer**, or other designee of the **Commissioner**, as applicable, together with a statement concerning how the decision may be appealed.

27.4.3 **Finality of Commissioner's Decision.** The **Commissioner's** decision shall be final and binding on all parties, unless presented to the Contract Dispute Resolution Board pursuant to this Article 27. The **City** may not take a petition to the Contract Dispute Resolution Board. However, should the **Contractor** take such a petition, the **City** may seek, and the Contract Dispute Resolution Board may render, a determination less favorable to the **Contractor** and more favorable to the **City** than the decision of the **Commissioner**.

27.5 **Presentation of Dispute to the Comptroller.** Before any dispute may be brought by the **Contractor** to the Contract Dispute Resolution Board, the **Contractor** must first present its claim to the **Comptroller** for his or her review, investigation, and possible adjustment.

27.5.1 **Time, Form, and Content of Notice.** Within thirty (30) **Days** of its receipt of a decision by the **Commissioner**, the **Contractor** shall submit to the **Comptroller** and to the **Commissioner** a Notice of Claim regarding its dispute with the **Agency**. The Notice of Claim shall consist of (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written decision of the **Commissioner**; and (iii) a copy of all materials submitted by the **Contractor** to the **Agency**, including the Notice of Dispute. The **Contractor** may not present to the **Comptroller** any material not presented to the **Commissioner**, except at the request of the **Comptroller**.

27.5.2 Response. Within thirty (30) **Days** of receipt of the Notice of Claim, the **Agency** shall make available to the **Comptroller** a copy of all material submitted by the **Agency** to the **Commissioner** in connection with the dispute. The **Agency** may not present to the **Comptroller** any material not presented to the **Commissioner** except at the request of the **Comptroller**.

27.5.3 **Comptroller Investigation.** The **Comptroller** may investigate the claim in dispute and, in the course of such investigation, may exercise all powers provided in Sections 7-201 and 7-203 of the Administrative Code. In addition, the **Comptroller** may demand of either party, and such party shall provide, whatever additional material the **Comptroller** deems pertinent to the claim, including original business records of the **Contractor**. Willful failure of the **Contractor** to produce within fifteen (15) **Days** any material requested by the **Comptroller** shall constitute a waiver by the **Contractor** of its claim. The **Comptroller** may also schedule an informal conference to be attended by the **Contractor**, **Agency** representatives, and any other personnel desired by the **Comptroller**.

27.5.4 Opportunity of **Comptroller** to Compromise or Adjust Claim. The **Comptroller** shall have forty-five (45) **Days** from his or her receipt of all materials referred to in Article 27.5.3 to investigate the disputed claim. The period for investigation and compromise may be further extended by agreement between the **Contractor** and the **Comptroller**, to a maximum of ninety (90) **Days** from the **Comptroller's** receipt of all materials. The **Contractor** may not present its petition to the Contract Dispute Resolution Board until the period for investigation and compromise delineated in this Article 27.5.4 has expired. In compromising or adjusting any claim hereunder, the **Comptroller** may not revise or disregard the terms of the **Contract** between the parties.

27.6 Contract Dispute Resolution Board. There shall be a Contract Dispute Resolution Board composed of:

27.6.1 The chief administrative law judge of the Office of Administrative Trials and Hearings (OATH) or his/her designated OATH administrative law judge, who shall act as chairperson, and may adopt operational procedures and issue such orders consistent with this Article 27 as may be necessary in the execution of the Contract Dispute Resolution Board's functions, including, but not limited to, granting extensions of time to present or respond to submissions;

27.6.2 The **CCPO** or his/her designee; any designee shall have the requisite background to consider and resolve the merits of the dispute and shall not have participated personally and substantially in the particular matter that is the subject of the dispute or report to anyone who so participated; and

27.6.3 A person with appropriate expertise who is not an employee of the **City**. This person shall be selected by the presiding administrative law judge from a prequalified panel of individuals, established and administered by OATH with appropriate background to act as decision-makers in a dispute. Such individual may not have a contract or dispute with the **City** or be an officer or employee of any company or organization that does, or regularly represents persons, companies, or organizations having disputes with the **City**.

27.7 Petition to the Contract Dispute Resolution Board. In the event the claim has not been settled or adjusted by the **Comptroller** within the period provided in this Article 27, the **Contractor**,

within thirty (30) **Days** thereafter, may petition the Contract Dispute Resolution Board to review the **Commissioner's** determination.

27.7.1 **Form and Content of Petition by Contractor.** The **Contractor** shall present its dispute to the Contract Dispute Resolution Board in the form of a petition, which shall include (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed, and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written Decision of the **Commissioner**, (iii) copies of all materials submitted by the **Contractor** to the Agency; (iv) a copy of the written decision of the **Comptroller**, if any, and (v) copies of all correspondence with, or written material submitted by the **Contractor**, to the **Comptroller**. The **Contractor** shall concurrently submit four (4) complete sets of the Petition: one set to the **City Corporation Counsel** (Attn: Commercial and Real Estate Litigation Division) and three (3) sets to the Contract Dispute Resolution Board at OATH's offices with proof of service on the **City Corporation Counsel**. In addition, the **Contractor** shall submit a copy of the written statement of the substance of the dispute, cited in (i) above, to both the **Commissioner** and the **Comptroller**.

27.7.2 **Agency Response.** Within thirty (30) **Days** of its receipt of the Petition by the **City Corporation Counsel**, the **Agency** shall respond to the brief written statement of the **Contractor** and make available to the Contract Dispute Resolution Board all material it submitted to the **Commissioner** and **Comptroller**. Three (3) complete copies of the **Agency** response shall be provided to the Contract Dispute Resolution Board and one to the **Contractor**. Extensions of time for submittal of the **Agency** response shall be given as necessary upon a showing of good cause or, upon consent of the parties, for an initial period of up to thirty (30) **Days**.

27.7.3 **Further Proceedings.** The Contract Dispute Resolution Board shall permit the **Contractor** to present its case by submission of memoranda, briefs, and oral argument. The Contract Dispute Resolution Board shall also permit the **Agency** to present its case in response to the **Contractor** by submission of memoranda, briefs, and oral argument. If requested by the **City Corporation Counsel**, the **Comptroller** shall provide reasonable assistance in the preparation of the **Agency's** case. Neither the **Contractor** nor the **Agency** may support its case with any documentation or other material that was not considered by the **Comptroller**, unless requested by the Contract Dispute Resolution Board. The Contract Dispute Resolution Board, in its discretion, may seek such technical or other expert advice as it shall deem appropriate and may seek, on its own or upon application of a party, any such additional material from any party as it deems fit. The Contract Dispute Resolution Board, in its discretion, may combine more than one dispute between the parties for concurrent resolution.

27.7.4 **Contract Dispute Resolution Board Determination.** Within forty-five (45) **Days** of the conclusion of all written submissions and oral arguments, the Contract Dispute Resolution Board shall render a written decision resolving the dispute. In an unusually complex case, the Contract Dispute Resolution Board may render its decision in a longer period, not to exceed ninety (90) **Days**, and shall so advise the parties at the commencement of this period. The Contract Dispute Resolution Board's decision must be consistent with the terms of the **Contract**. Decisions of the Contract Dispute Resolution Board shall only resolve matters before the Contract Dispute Resolution Board and shall not have precedential effect with respect to matters not before the Contract Dispute Resolution Board.

27.7.5 Notification of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board shall send a copy of its decision to the **Contractor**, the **ACCO**, the Engineer, the **Comptroller**, the **City Corporation Counsel**, the **CCPO**, and the **PPB**. A decision in favor of the **Contractor** shall be subject to the prompt payment provisions of the **PPB Rules**. The Required Payment Date shall be thirty (30) Days after the date the parties are formally notified of the Contract Dispute Resolution Board's decision.

27.7.6 Finality of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board's decision shall be final and binding on all parties. Any party may seek review of the Contract Dispute Resolution Board's decision solely in the form of a challenge, filed within four (4) months of the date of the Contract Dispute Resolution Board's decision, in a court of competent jurisdiction of the State of New York, County of New York pursuant to Article 78 of the Civil Practice Law and Rules. Such review by the court shall be limited to the question of whether or not the Contract Dispute Resolution Board's decision was made in violation of lawful procedure, was affected by an error of **Law**, or was arbitrary and capricious or an abuse of discretion. No evidence or information shall be introduced or relied upon in such proceeding that was not presented to the Contract Dispute Resolution Board in accordance with this Article 27.

27.8 Any termination, cancellation, or alleged breach of the **Contract** prior to or during the pendency of any proceedings pursuant to this Article 27 shall not affect or impair the ability of the **Commissioner** or Contract Dispute Resolution Board to make a binding and final decision pursuant to this Article 27.

#### **ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON A TIME & MATERIALS BASIS**

28.1 While the **Contractor** or any of its **Subcontractors** is performing **Work** on a time and material basis or **Extra Work** on a time and material basis ordered by the **Commissioner** under Article 25, or where the **Contractor** believes that it or any of its **Subcontractors** is performing **Extra Work** but a final determination by **Agency** has not been made, or the **Contractor** or any of its **Subcontractors** is performing disputed **Work** (whether on or off the **Site**), or complying with a determination or order under protest in accordance with Articles 11, 27, and 30, in each such case the **Contractor** shall furnish the **Resident Engineer** daily with three (3) copies of written statements signed by the **Contractor's** representative at the **Site** showing:

28.1.1 The name, trade, and number of each worker employed on such **Work** or engaged in complying with such determination or order, the number of hours employed, and the character of the **Work** each is doing; and

28.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such **Work** or compliance with such determination or order, and from whom purchased or rented.

28.2 A copy of such statement will be countersigned by the **Resident Engineer**, noting thereon any items not agreed to or questioned, and will be returned to the **Contractor** within two (2) **Days** after submission.

28.3 The **Contractor** and its **Subcontractors**, when required by the **Commissioner**, or the **Comptroller**, shall also produce for inspection, at the office of the **Contractor** or **Subcontractor**, any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries and reports,

and cancelled checks, and any other documents relating to showing the nature and quantity of the labor, materials, plant and equipment actually used in the performance of such **Work**, or in complying with such determination or order, and the amounts expended therefor, and shall permit the **Commissioner** and the **Comptroller** to make such extracts therefrom, or copies thereof, as they or either of them may desire.

28.4 In connection with the examination provided for herein, the **Commissioner**, upon demand therefor, will produce for inspection by the **Contractor** such records as the **Agency** may have with respect to such **Extra Work** or disputed **Work** performed under protest pursuant to order of the **Commissioner**, except those records and reports which may have been prepared for the purpose of determining the accuracy and validity of the **Contractor's** claim.

28.5 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such **Work** or compliance with such determination or order.

#### **ARTICLE 29. OMITTED WORK**

29.1 If any **Contract Work** in a lump sum **Contract**, or if any part of a lump sum item in a unit price, lump sum, or percentage-bid **Contract** is omitted by the **Commissioner** pursuant to Article 33, the **Contract** price, subject to audit by the EAO, shall be reduced by a pro rata portion of the lump sum bid amount based upon the percent of **Work** omitted subject to Article 29.4. For the purpose of determining the pro rata portion of the lump sum bid amount, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be the determining factor.

29.2 If the whole of a lump sum item or units of any other item is so omitted by the **Commissioner** in a unit price, lump sum, or percentage-bid **Contract**, then no payment will be made therefor except as provided in Article 29.4.

29.3 For units that have been ordered but are only partially completed, the unit price shall be reduced by a pro rata portion of the unit price bid based upon the percentage of **Work** omitted subject to Article 29.4.

29.4 In the event the **Contractor**, with respect to any omitted **Work**, has purchased any non-cancelable material and/or equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated into the **Work**, the **Contractor** shall be paid for such material and/or equipment in accordance with Article 64.2.1(b); provided, however, such payment is contingent upon the **Contractor's** delivery of such material and/or equipment in acceptable condition to a location designated by the **City**.

29.5 The **Contractor** agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted **Work**.

#### **ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES; PRODUCTION OF FINANCIAL RECORDS**

30.1 If the **Contractor** shall claim to be sustaining damages by reason of any act or omission of the **City** or its agents, it shall submit to the **Commissioner** within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter to the extent additional damages are being incurred for the same condition, verified statements of the details and the amounts of such

damages, together with documentary evidence of such damages. The **Contractor** may submit any of the above statements within such additional time as may be granted by the **Commissioner** in writing upon written request therefor. Failure of the **Commissioner** to respond in writing to a written request for additional time within thirty (30) **Days** shall be deemed a denial of the request. On failure of the **Contractor** to strictly comply with the foregoing provisions, such claims shall be deemed waived and no right to recover on such claims shall exist. Damages that the **Contractor** may claim in any action or dispute resolution procedure arising under or by reason of this **Contract** shall not be different from or in excess of the statements and documentation made pursuant to this Article 30. This Article 30.1 does not apply to claims submitted to the **Commissioner** pursuant to Article 11 or to claims disputing a determination under Article 27.

30.2 In addition to the foregoing statements, the **Contractor** shall, upon notice from the **Commissioner**, produce for examination at the **Contractor's** office, by the **Engineer, Architect or Project Manager**, all of its books of account, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**, and submit itself and persons in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.3 In addition to the statements required under Article 28 and this Article 30, the **Contractor** and/or its **Subcontractor** shall, within thirty (30) **Days** upon notice from the **Commissioner** or **Comptroller**, produce for examination at the **Contractor's** and/or **Subcontractor's** office, by a representative of either the **Commissioner** or **Comptroller**, all of its books of account, bid documents, financial statements, accountant workpapers, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**. Further, the **Contractor** and/or its **Subcontractor** shall submit any person in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.4 Unless the information and examination required under Article 30.3 is provided by the **Contractor** and/or its **Subcontractor** upon thirty (30) **Days'** notice from the **Commissioner** or **Comptroller**, or upon the **Commissioner's** or **Comptroller's** written authorization to extend the time to comply, the **City** shall be released from all claims arising under, relating to or by reason of this **Contract**, except for sums certified by the **Commissioner** to be due under the provisions of this **Contract**. It is further stipulated and agreed that no person has the power to waive any of the foregoing provisions and that in any action or dispute resolution procedure against the **City** to recover any sum in excess of the sums certified by the **Commissioner** to be due under or by reason of this **Contract**, the **Contractor** must allege in its complaint and prove, at trial or during such dispute resolution procedure, compliance with the provisions of this Article 30.

30.5 In addition, after the commencement of any action or dispute resolution procedure by the **Contractor** arising under or by reason of this **Contract**, the **City** shall have the right to require the **Contractor** to produce for examination under oath, up until the trial of the action or hearing before the Contract Dispute Resolution Board, the books and documents described in Article 30.3 and submit itself and all persons in its employ for examination under oath. If this Article 30 is not complied with as required, then the **Contractor** hereby consents to the dismissal of the action or dispute resolution procedure.

**CHAPTER VII: POWERS OF THE RESIDENT ENGINEER, THE ENGINEER OR  
ARCHITECT AND THE COMMISSIONER**

**ARTICLE 31. THE RESIDENT ENGINEER**

31.1 The **Resident Engineer** shall have the power to inspect, supervise, and control the performance of the **Work**, subject to review by the **Commissioner**. The **Resident Engineer** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

**ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER**

32.1 The **Engineer** or **Architect** or **Project Manager**, in addition to those matters elsewhere herein delegated to the **Engineer** and expressly made subject to his/her determination, direction or approval, shall have the power, subject to review by the **Commissioner**:

32.1.1 To determine the amount, quality, and location of the **Work** to be paid for hereunder; and

32.1.2 To determine all questions in relation to the **Work**, to interpret the **Contract Drawings, Specifications, and Addenda**, and to resolve all patent inconsistencies or ambiguities therein; and

32.1.3 To determine how the **Work** of this **Contract** shall be coordinated with **Work** of **Other Contractors** engaged simultaneously on this **Project**, including the power to suspend any part of the **Work**, but not the whole thereof; and

32.1.4 To make minor changes in the **Work** as he/she deems necessary, provided such changes do not result in a net change in the cost to the **City** or to the **Contractor** of the **Work** to be done under the **Contract**; and

32.1.5 To amplify the **Contract Drawings**, add explanatory information and furnish additional **Specifications** and drawings, consistent with this **Contract**.

32.2 The foregoing enumeration shall not imply any limitation upon the power of the **Engineer** or **Architect** or **Project Manager**, for it is the intent of this **Contract** that all of the **Work** shall generally be subject to his/her determination, direction, and approval, except where the determination, direction or approval of someone other than the **Engineer** or **Architect** or **Project Manager** is expressly called for herein.

32.3 The **Engineer** or **Architect** or **Project Manager** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

**ARTICLE 33. THE COMMISSIONER**

33.1 The **Commissioner**, in addition to those matters elsewhere herein expressly made subject to his/her determination, direction or approval, shall have the power:

33.1.1 To review and make determinations on any and all questions in relation to this **Contract** and its performance; and

33.1.2 To modify or change this **Contract** so as to require the performance of **Extra Work** (subject, however, to the limitations specified in Article 25) or the omission of **Contract Work**; and

33.1.3 To suspend the whole or any part of the **Work** whenever in his/her judgment such suspension is required:

33.1.3(a) In the interest of the **City** generally; or

33.1.3(b) To coordinate the **Work** of the various contractors engaged on this **Project** pursuant to the provisions of Article 12; or

33.1.3(c) To expedite the completion of the entire **Project** even though the completion of this particular **Contract** may thereby be delayed.

#### ARTICLE 34. NO ESTOPPEL

34.1 Neither the **City** nor any **Agency**, official, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this **Contract** by the **City**, the **Commissioner**, the **Engineer**, the **Resident Engineer**, or any other official, agent or employee of the **City**, either before or after the final completion and acceptance of the **Work** and payment therefor:

34.1.1 From showing the true and correct classification, amount, quality or character of the **Work** actually done; or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the **Work**, or any part thereof, does not in fact conform to the requirements of this **Contract**; and

34.1.2 From demanding and recovering from the **Contractor** any overpayment made to it, or such damages as the **City** may sustain by reason of the **Contractor's** failure to perform each and every part of its **Contract**.

### CHAPTER VIII: LABOR PROVISIONS

#### ARTICLE 35. EMPLOYEES

35.1 The **Contractor** and its **Subcontractors** shall not employ on the **Work**:

35.1.1 Anyone who is not competent, faithful and skilled in the **Work** for which he/she shall be employed; and whenever the **Commissioner** shall inform the **Contractor**, in writing, that any employee is, in his/her opinion, incompetent, unfaithful or disobedient, that employee shall be discharged from the **Work** forthwith, and shall not again be employed upon it; or

35.1.2 Any labor, materials or means whose employment, or utilization during the course of this **Contract**, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of **Work** or similar troubles by workers employed by the **Contractor** or its **Subcontractors**, or by any of the trades working in or about the buildings and premises where **Work** is being performed under this **Contract**, or by **Other Contractors** or their **Subcontractors** pursuant to other contracts, or on any other building or premises owned or operated by the **City**, its **Agencies**, departments, boards or authorities. Any violation by the **Contractor** of this requirement may, upon certification of the **Commissioner**, be considered as proper and sufficient cause for declaring the **Contractor** to be in default, and for the **City** to take action against it as set forth in Chapter X of this **Contract**, or such other article of this **Contract** as the Commissioner may deem proper; or

35.1.3 In accordance with Section 220.3-e of the Labor Law of the State of New York (hereinafter "Labor Law"), the **Contractor** and its **Subcontractors** shall not employ on the **Work** any apprentice, unless he/she is a registered individual, under a bona fide program registered with the New York State Department of Labor. The allowable ratio of apprentices to journey-level workers in any craft classification shall not be greater than the ratio permitted to the **Contractor** as to its work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the **Comptroller** of the **City** for the classification of **Work** actually performed. The **Contractor** or **Subcontractor** will be required to furnish written evidence of the registration of its program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the **Contract Work**.

35.2 If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand (\$250,000) dollars, all laborers, workers, and mechanics employed in the performance of the **Contract** on the public work site, either by the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by the **Contract**, shall be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration.

35.3 In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the Administrative Code, respectively,

35.3.1 The **Contractor** shall not take an adverse personnel action with respect to an officer or employee in retaliation for such officer or employee making a report of information concerning conduct which such officer or employee knows or reasonably believes to involve corruption, criminal activity, conflict of interest, gross mismanagement or abuse of authority by any officer or employee relating to this **Contract** to (a) the Commissioner of the Department of Investigation, (b) a member of the New York City Council, the Public Advocate, or the **Comptroller**, or (c) the **CCPO**, **ACCO**, **Agency** head, or **Commissioner**.

35.3.2 If any of the **Contractor's** officers or employees believes that he or she has been the subject of an adverse personnel action in violation of Article 35.3.1, he or she shall be entitled to bring a cause of action against the **Contractor** to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (a) an injunction to restrain continued retaliation, (b) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (c) reinstatement of full fringe benefits and seniority rights, (d) payment of two times back

pay, plus interest, and (e) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.

35.3.3 The **Contractor** shall post a notice provided by the **City** in a prominent and accessible place on any site where work pursuant to the **Contract** is performed that contains information about:

35.3.3(a) how its employees can report to the New York City Department of Investigation allegations of fraud, false claims, criminality or corruption arising out of or in connection with the **Contract**; and

35.3.3(b) the rights and remedies afforded to its employees under Administrative Code sections 7-805 (the New York City False Claims Act) and 12-113 (the Whistleblower Protection Expansion Act) for lawful acts taken in connection with the reporting of allegations of fraud, false claims, criminality or corruption in connection with the **Contract**.

35.3.4 For the purposes of this Article 35.3, "adverse personnel action" includes dismissal, demotion, suspension, disciplinary action, negative performance evaluation, any action resulting in loss of staff, office space, equipment or other benefit, failure to appoint, failure to promote, or any transfer or assignment or failure to transfer or assign against the wishes of the affected officer or employee.

35.3.5 This Article 35.3 is applicable to all of the **Contractor's** **Subcontractors** having subcontracts with a value in excess of \$100,000; accordingly, the **Contractor** shall include this rider in all subcontracts with a value in excess of \$100,000.

35.4 Article 35.3 is not applicable to this **Contract** if it is valued at \$100,000 or less. Articles 35.3.1, 35.3.2, 35.3.4, and 35.3.5 are not applicable to this **Contract** if it was solicited pursuant to a finding of an emergency.

35.5 Paid Sick Leave Law.

35.5.1 Introduction and General Provisions.

35.5.1(a) The Earned Sick Time Act, also known as the Paid Sick Leave Law ("PSLL"), requires covered employees who annually perform more than 80 hours of work in New York City to be provided with paid sick time.<sup>2</sup> Contractors of the **City** or of other governmental entities may be required to provide sick time pursuant to the PSLL.

35.5.1(b) The PSLL became effective on April 1, 2014, and is codified at Title 20, Chapter 8, of the New York City Administrative Code. It is administered by the City's Department of Consumer Affairs ("DCA"); DCA's rules promulgated under the PSLL are codified at Chapter 7 of Title 6 of the Rules of the City of New York ("Rules").

<sup>2</sup> Pursuant to the PSLL, if fewer than five employees work for the same employer, as determined pursuant to New York City Administrative Code § 20-912(g), such employer has the option of providing such employees uncompensated sick time.

35.5.1(c) The **Contractor** agrees to comply in all respects with the PSL and the Rules, and as amended, if applicable, in the performance of this **Contract**. The **Contractor** further acknowledges that such compliance is a material term of this **Contract** and that failure to comply with the PSL in performance of this **Contract** may result in its termination.

35.5.1(d) The **Contractor** must notify the **Agency Chief Contracting Officer** of the **Agency** with whom it is contracting in writing within ten (10) days of receipt of a complaint (whether oral or written) regarding the PSL involving the performance of this **Contract**. Additionally, the **Contractor** must cooperate with DCA's education efforts and must comply with DCA's subpoenas and other document demands as set forth in the PSL and Rules.

35.5.1(e) The PSL is summarized below for the convenience of the **Contractor**. The **Contractor** is advised to review the PSL and Rules in their entirety. On the website [www.nyc.gov/PaidSickLeave](http://www.nyc.gov/PaidSickLeave) there are links to the PSL and the associated Rules as well as additional resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the **Contractor** can get more information about how to comply with the PSL. The **Contractor** acknowledges that it is responsible for compliance with the PSL notwithstanding any inconsistent language contained herein.

#### 35.5.2 Pursuant to the PSL and the Rules: Applicability, Accrual, and Use.

35.5.2(a) An employee who works within the City of New York for more than eighty hours in any consecutive 12-month period designated by the employer as its "calendar year" pursuant to the PSL ("Year") must be provided sick time. Employers must provide a minimum of one hour of sick time for every 30 hours worked by an employee and compensation for such sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage. Employers are not required to provide more than 40 hours of sick time to an employee in any Year.

35.5.2(b) An employee has the right to determine how much sick time he or she will use, provided that employers may set a reasonable minimum increment for the use of sick time not to exceed four hours per **Day**. In addition, an employee may carry over up to 40 hours of unused sick time to the following Year, provided that no employer is required to allow the use of more than forty hours of sick time in a Year or carry over unused paid sick time if the employee is paid for such unused sick time and the employer provides the employee with at least the legally required amount of paid sick time for such employee for the immediately subsequent Year on the first **Day** of such Year.

35.5.2(c) An employee entitled to sick time pursuant to the PSL may use sick time for any of the following:

- i. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;
- ii. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild or grandparent, or the child or parent of an employee's spouse or domestic partner) who has a mental

- illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;
- iii. closure of such employee's place of business by order of a public official due to a public health emergency; or
  - iv. such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency.

35.5.2(d) An employer must not require an employee, as a condition of taking sick time, to search for a replacement. However, an employer may require an employee to provide: reasonable notice of the need to use sick time; reasonable documentation that the use of sick time was needed for a reason above if for an absence of more than three consecutive work days; and/or written confirmation that an employee used sick time pursuant to the PSLL. However, an employer may not require documentation specifying the nature of a medical condition or otherwise require disclosure of the details of a medical condition as a condition of providing sick time and health information obtained solely due to an employee's use of sick time pursuant to the PSLL must be treated by the employer as confidential.

35.5.2(e) If an employer chooses to impose any permissible discretionary requirement as a condition of using sick time, it must provide to all employees a written policy containing those requirements, using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny sick time to an employee because of non-compliance with such a policy.

35.5.2(f) Sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the sick time was used.

35.5.3 Exemptions and Exceptions. Notwithstanding the above, the PSLL does not apply to any of the following:

35.5.3(a) an independent contractor who does not meet the definition of employee under section 190(2) of the New York State Labor Law;

35.5.3(b) an employee covered by a valid collective bargaining agreement in effect on April 1, 2014, until the termination of such agreement;

35.5.3(c) an employee in the construction or grocery industry covered by a valid collective bargaining agreement if the provisions of the PSLL are expressly waived in such collective bargaining agreement;

35.5.3(d) an employee covered by another valid collective bargaining agreement if such provisions are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the PSLL for such employee;

35.5.3(e) an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines his or her own schedule, has the ability to reject or accept any assignment referred to him or her, and is paid an average hourly wage that is at least four times the federal minimum wage;

35.5.3(f) an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

35.5.3(g) an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or

35.5.3(h) a participant in a Work Experience Program (WEP) under section 336-c of the New York State Social Services Law.

35.5.4 Retaliation Prohibited. An employer may not threaten or engage in retaliation against an employee for exercising or attempting in good faith to exercise any right provided by the PSLL. In addition, an employer may not interfere with any investigation, proceeding, or hearing pursuant to the PSLL.

35.5.5 Notice of Rights.

35.5.5(a) An employer must provide its employees with written notice of their rights pursuant to the PSLL. Such notice must be in English and the primary language spoken by an employee, provided that DCA has made available a translation into such language. Downloadable notices are available on DCA's website at <http://www.nyc.gov/html/dca/html/law/PaidSickLeave.shtml>.

35.5.5(b) Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed fifty dollars for each employee who was not given appropriate notice.

35.5.6 Records. An employer must retain records documenting its compliance with the PSLL for a period of at least three years, and must allow DCA to access such records in furtherance of an investigation related to an alleged violation of the PSLL.

35.5.7 Enforcement and Penalties.

35.5.7(a) Upon receiving a complaint alleging a violation of the PSLL, DCA has the right to investigate such complaint and attempt to resolve it through mediation. Within **30 Days** of written notification of a complaint by DCA, or sooner in certain circumstances, the employer must provide DCA with a written response and such other information as DCA may request. If DCA believes that a violation of the PSLL has occurred, it has the right to issue a notice of violation to the employer.

35.5.7(b) DCA has the power to grant an employee or former employee all appropriate relief as set forth in New York City Administrative Code § 20-924(d). Such relief may include, among other remedies, treble damages for the wages that should have been paid, damages for unlawful retaliation, and damages and reinstatement for unlawful discharge. In addition, DCA may impose on an employer found to have violated the PSLL civil penalties not to exceed \$500 for a first violation, \$750 for a second violation within two years of the first violation, and \$1,000 for each succeeding violation within two years of the previous violation.

35.5.8 More Generous Policies and Other Legal Requirements. Nothing in the PSLL is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous sick time policy, or the obligation of an employer to comply with any contract,

collective bargaining agreement, employment benefit plan or other agreement providing more generous sick time. The PSLL provides minimum requirements pertaining to sick time and does not preempt, limit or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of sick leave or time, whether paid or unpaid, or that extends other protections to employees. The PSLL may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

35.6 HireNYC: Hiring and Reporting Requirements. This Article 35.6 applies to construction contracts of \$1,000,000 or more. The **Contractor** shall comply with the requirements of Articles 35.6.1-35.6.5 for all non-trades jobs (e.g., for an administrative position arising out of **Work** ant located in New York City). The **Contractor** shall reasonably cooperate with SBS and the **City** on specific outreach events, including "Hire-on-the-Spot" events, for the hiring of trades workers in connection with the **Work**. If provided elsewhere in this **Contract**, this **Contract** is subject to a project labor agreement.

35.6.1 Enrollment. The **Contractor** shall enroll with the HireNYC system, found at [www.nyc.gov/sbs](http://www.nyc.gov/sbs), within thirty (30) days after the registration of this **Contract** pursuant to Section 328 of the New York City Charter. The **Contractor** shall provide information about the business, designate a primary contact and say whether it intends to hire for any entry to mid-level job opportunities arising from this **Contract** and located in New York City, and, if so, the approximate start date of the first hire.

35.6.2 Job Posting Requirements.

35.6.2(a) Once enrolled in HireNYC, the **Contractor** agrees to update the HireNYC portal with all entry to mid-level job opportunities arising from this **Contract** and located in New York City, if any, which shall be defined as jobs requiring no more than an associate degree, as provided by the New York State Department of Labor (see Column F of <https://labor.ny.gov/stats/2012-2022-NYS-Employment-Prospects.xls>). The information to be updated includes the types of entry and mid-level positions made available from the work arising from the **Contract** and located in New York City, the number of positions, the anticipated schedule of initiating the hiring process for these positions, and the contact information for the **Contractor's** representative charged with overseeing hiring. The **Contractor** must update the HireNYC portal with any hiring needs arising from the contract and located in New York City, and the requirements of the jobs to be filled, no less than three weeks prior to the intended first day of employment for each new position, except with the permission of SBS, not to be unreasonably withheld, and must also update the HireNYC portal as set forth below.

35.6.2(b) After enrollment through HireNYC and submission of relevant information, SBS will work with the **Contractor** to develop a recruitment plan which will outline the candidate screening process, and will provide clear instructions as to when, where, and how interviews will take place. HireNYC will screen applicants based on employer requirements and refer applicants whom it believes are qualified to the **Contractor** for interviews. The **Contractor** must interview referred applicants whom it believes are qualified.

35.6.2(c) After completing an interview of a candidate referred by HireNYC, the **Contractor** must provide feedback via the portal within twenty (20) business days to indicate which candidates were interviewed and hired, if any. In addition, the **Contractor** shall provide the start date of new hires, and additional information

reasonably related to such hires, within twenty (20) business days after the start date. In the event the **Contractor** does not have any job openings covered by this Rider in any given year, the **Contractor** shall be required to provide an annual update to HireNYC to that effect. For this purpose, the reporting year shall run from the date of the registration of the **Contract** pursuant to Charter section 328 and each anniversary date.

35.6.2(d) These requirements do not limit the **Contractor's** ability to assess the qualifications of prospective workers, and to make final hiring and retention decisions. No provision of this Article 35.6 shall be interpreted so as to require the **Contractor** to employ any particular worker.

35.6.2(e) In addition, the provisions of this Article 35.6 shall not apply to positions that the **Contractor** intends to fill with employees employed pursuant to the job retention provision of Section 22-505 of the Administrative Code of the City of New York. The **Contractor** shall not be required to report such openings with HireNYC. However, the **Contractor** shall enroll with the HireNYC system pursuant to Article 35.6.1, above, and, if such positions subsequently become open, then the remaining provisions of this Article 35.6 will apply.

35.6.3 Breach and Liquidated Damages. If the **Contractor** fails to comply with the terms of the **Contract** and this Article 35.6 (1) by not enrolling its business with HireNYC; (2) by not informing HireNYC, as required, of open positions; or (3) by failing to interview a qualified candidate, the **Agency** may assess liquidated damages in the amount of two-thousand five hundred dollars (\$2,500) per breach. For all other events of noncompliance with the terms of this Article 35.6, the **Agency** may assess liquidated damages in the amount of five hundred dollars (\$500) per breach. Furthermore, in the event the **Contractor** breaches the requirements of this Article 35.6 during the term of the **Contract**, the **City** may hold the **Contractor** in default of this **Contract**.

35.6.4 Audit Compliance. In addition to the auditing requirements set forth in other parts of the **Contract**, the **Contractor** shall permit SBS and the **City** to inspect any and all records concerning or relating to job openings or the hiring of individuals for work arising from the **Contract** and located in New York City. The **Contractor** shall permit an inspection within seven (7) business days of the request.

35.6.5 Other Reporting Requirements. The **Contractor** shall report to the **City**, on a monthly basis, all information reasonably requested by the **City** that is necessary for the **City** to comply with any reporting requirements imposed by **Law**, including any requirement that the **City** maintain a publicly accessible database. In addition, the **Contractor** agrees to comply with all reporting requirements imposed by **Law**, or as otherwise requested by the **City**.

35.6.6 Federal Hiring Requirements. If this **Contract** is federally funded (as indicated elsewhere in this **Contract**), the **Contractor** shall comply with all federal hiring requirements as may be set forth in this **Contract**, including, as applicable: (a) Section 3 of the HUD Act of 1968, which requires, to the greatest extent feasible, economic opportunities for 30 percent of new hires be given to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing and Executive Order 11246, which prohibits discrimination in employment due to race, color, religion, sex or national origin, and requires the implementation of goals for minority and female participation for work involving any construction trade.

### ARTICLE 36. NO DISCRIMINATION

36.1 The **Contractor** specifically agrees, as required by Labor Law Section 220-e, as amended, that:

36.1.1 In the hiring of employees for the performance of **Work** under this **Contract** or any subcontract hereunder, neither the **Contractor**, **Subcontractor**, nor any person acting on behalf of such **Contractor** or **Subcontractor**, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the **Work** to which the employment relates;

36.1.2 Neither the **Contractor**, **Subcontractor**, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of **Work** under this **Contract** on account of race, creed, color or national origin;

36.1.3 There may be deducted from the amount payable to the **Contractor** by the **City** under this **Contract** a penalty of fifty (\$50.00) dollars for each person for each **Day** during which such person was discriminated against or intimidated in violation of the provisions of this **Contract**; and

36.1.4 This **Contract** may be cancelled or terminated by the **City** and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this Article 36.

36.1.5 This Article 36 covers all construction, alteration and repair of any public building or public work occurring in the State of New York and the manufacture, sale, and distribution of materials, equipment, and supplies to the extent that such operations are performed within the State of New York pursuant to this **Contract**.

36.2 The **Contractor** specifically agrees, as required by Section 6-108 of the Administrative Code, as amended, that:

36.2.1 It shall be unlawful for any person engaged in the construction, alteration or repair of buildings or engaged in the construction or repair of streets or highways pursuant to a **Contract** with the **City** or engaged in the manufacture, sale or distribution of materials, equipment or supplies pursuant to a **Contract** with the **City** to refuse to employ or to refuse to continue in any employment any person on account of the race, color or creed of such person.

36.2.2 It shall be unlawful for any person or any servant, agent or employee of any person, described in Article 36.1.2, to ask, indicate or transmit, orally or in writing, directly or indirectly, the race, color or creed or religious affiliation of any person employed or seeking employment from such person, firm or corporation.

36.2.3 Breach of the foregoing provisions shall be deemed a violation of a material provision of this **Contract**.

36.2.4 Any person, or the employee, manager or owner of or officer of such firm or corporation who shall violate any of the provisions of this Article 36.2 shall, upon

conviction thereof, be punished by a fine of not more than one hundred (\$100.00) dollars or by imprisonment for not more than thirty (30) **Days**, or both.

36.3 This **Contract** is subject to the requirements of Executive Order No. 50 (1980) ("E.O. 50"), as revised, and the rules and regulations promulgated thereunder. No contract will be awarded unless and until these requirements have been complied with in their entirety. By signing this **Contract**, the **Contractor** agrees that it:

36.3.1 Will not engage in any unlawful discrimination against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, rates of pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment; and

36.3.2 Will not engage in any unlawful discrimination in the selection of **Subcontractors** on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation; and

36.3.3 Will state in all solicitations or advertisements for employees placed by or on behalf of the **Contractor** that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, citizens status, disability, marital status, sexual orientation, or that it is an equal employment opportunity employer; and

36.3.4 Will send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or memorandum of understanding, written notification of its equal employment opportunity commitments under E.O. 50 and the rules and regulations promulgated thereunder; and

36.3.5 Will furnish, before the award of the **Contract**, all information and reports, including an employment report, that are required by E.O. 50, the rules and regulations promulgated thereunder, and orders of the City Department of Business Services, Division of Labor Services (**DLS**) and will permit access to its books, records, and accounts by the **DLS** for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

36.4 The **Contractor** understands that in the event of its noncompliance with the nondiscrimination clauses of this **Contract** or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of this **Contract** and noncompliance with E.O. 50 and the rules and regulations promulgated thereunder. After a hearing held pursuant to the rules of the **DLS**, the Director of the **DLS** may direct the **Commissioner** to impose any or all of the following sanctions:

36.4.1 Disapproval of the **Contractor**; and/or

36.4.2 Suspension or termination of the **Contract**; and/or

36.4.3 Declaring the **Contractor** in default; and/or

36.4.4 In lieu of any of the foregoing sanctions, the Director of the **DLS** may impose an employment program.

In addition to any actions taken under this **Contract**, failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in a **City Agency** declaring the **Contractor** to be non-responsible in future procurements. The **Contractor** further agrees that it will refrain from entering into any **Contract** or **Contract** modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a **Subcontractor** who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder.

36.5 The **Contractor** specifically agrees, as required by Section 6-123 of the Administrative Code, that:

36.5.1 The **Contractor** will not engage in any unlawful discriminatory practice in violation of Title 8 of the Administrative Code; and

36.5.2 Any failure to comply with this Article 36.5 may subject the **Contractor** to the remedies set forth in Section 6-123 of the Administrative Code, including, where appropriate, sanctions such as withholding of payment, imposition of an employment program, finding the **Contractor** to be in default, cancellation of the **Contract**, or any other sanction or remedy provided by **Law** or **Contract**.

### ARTICLE 37. LABOR LAW REQUIREMENTS

37.1 The **Contractor** shall strictly comply with all applicable provisions of the Labor Law, as amended. Such compliance is a material term of this **Contract**.

37.2 The **Contractor** specifically agrees, as required by Labor Law Sections 220 and 220-d, as amended, that:

37.2.1 Hours of **Work**: No laborer, worker, or mechanic in the employ of the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by this **Contract** shall be permitted or required to work more than eight (8) hours in any one (1) **Day**, or more than five (5) **Days** in any one (1) week, except as provided in the Labor Law and in cases of extraordinary emergency including fire, flood, or danger to life or property, or in the case of national emergency when so proclaimed by the President of the United States of America.

37.2.2 In situations in which there are not sufficient laborers, workers, and mechanics who may be employed to carry on expeditiously the **Work** contemplated by this **Contract** as a result of such restrictions upon the number of hours and **Days** of labor, and the immediate commencement or prosecution or completion without undue delay of the **Work** is necessary for the preservation of the **Site** and/or for the protection of the life and limb of the persons using the same, such laborers, workers, and mechanics shall be permitted or required to work more than eight (8) hours in any one (1) **Day**; or five (5) **Days** in any one (1) week; provided, however, that upon application of any **Contractor**, the **Commissioner** shall have first certified to the Commissioner of Labor of the State of New York (hereinafter "Commissioner of Labor") that such public **Work** is of an important nature and that a delay in carrying it to completion would result in serious disadvantage to the public; and provided, further, that such Commissioner of Labor shall have determined that such an emergency does in fact exist as provided in Labor Law Section 220.2.

37.2.3 Failure of the **Commissioner** to make such a certification to the Commissioner of Labor shall not entitle the **Contractor** to damages for delay or for any cause whatsoever.

37.2.4 Prevailing Rate of Wages: The wages to be paid for a legal day's **Work** to laborers, workers, or mechanics employed upon the **Work** contemplated by this **Contract** or upon any materials to be used thereon shall not be less than the "prevailing rate of wage" as defined in Labor Law Section 220, and as fixed by the **Comptroller** in the attached Schedule of Wage Rates and in updated schedules thereof. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the **Work** is being performed.

37.2.5 Requests for interpretation or correction in the Information for Bidders includes all requests for clarification of the classification of trades to be employed in the performance of the **Work** under this **Contract**. In the event that a trade not listed in the **Contract** is in fact employed during the performance of this **Contract**, the **Contractor** shall be required to obtain from the **Agency** the prevailing wage rates and supplementary benefits for the trades used and to complete the performance of this **Contract** at the price at which the **Contract** was awarded.

37.2.6 Minimum Wages: Except for employees whose wage is required to be fixed pursuant to Labor Law Section 220, all persons employed by the **Contractor** and any **Subcontractor** in the manufacture or furnishing of the supplies, materials, or equipment, or the furnishing of work, labor, or services, used in the performance of this **Contract**, shall be paid, without subsequent deduction or rebate unless expressly authorized by **Law**, not less than the sum mandated by **Law**.

37.3 Working Conditions: No part of the **Work**, labor or services shall be performed or rendered by the **Contractor** in any plants, factories, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of this **Contract**. Compliance with the safety, sanitary, and factory inspection **Laws** of the state in which the **Work** is to be performed shall be prima facie evidence of compliance with this Article 37.3.

37.4 Prevailing Wage Enforcement: The **Contractor** agrees to pay for all costs incurred by the **City** in enforcing prevailing wage requirements, including the cost of any investigation conducted by or on behalf of the **Agency** or the **Comptroller**, where the **City** discovers a failure to comply with any of the requirements of this Article 37 by the **Contractor** or its **Subcontractor(s)**. The **Contractor** also agrees that, should it fail or refuse to pay for any such investigation, the **Agency** is hereby authorized to deduct from a **Contractor's** account an amount equal to the cost of such investigation.

37.4.1 The Labor Law Section 220 and Section 220-d, as amended, provide that this **Contract** shall be forfeited and no sum paid for any **Work** done hereunder on a second conviction for willfully paying less than:

37.4.1(a) The stipulated prevailing wage scale as provided in Labor Law section 220, as amended, or

37.4.1(b) The stipulated minimum hourly wage scale as provided in Labor Law section 220-d, as amended.

37.4.2 For any breach or violation of either working conditions (Article 37.3) or minimum wages (Article 37.2.6) provisions, the party responsible therefor shall be liable to the **City** for liquidated damages, which may be withheld from any amounts due on any contracts with the **City** of such party responsible, or may be recovered in actions brought by the **City**

Corporation Counsel in the name of the **City**, in addition to damages for any other breach of this **Contract**, for a sum equal to the amount of any underpayment of wages due to any employee engaged in the performance of this **Contract**. In addition, the **Commissioner** shall have the right to cancel contracts and enter into other contracts for the completion of the original contract, with or without public letting, and the original **Contractor** shall be liable for any additional cost. All sums withheld or recovered as deductions, rebates, refunds, or underpayment of wages hereunder, shall be held in a special deposit account and shall be paid without interest, on order of the **Comptroller**, directly to the employees who have been paid less than minimum rates of pay as set forth herein and on whose account such sums were withheld or recovered, provided that no claims by employees for such payments shall be entertained unless made within two (2) years from the date of actual notice to the **Contractor** of the withholding or recovery of such sums by the **City**.

37.4.3 A determination by the **Comptroller** that a **Contractor** and/or its **Subcontractor** willfully violated Labor Law Section 220 will be forwarded to the **City's** five District Attorneys for review.

37.4.4 The **Contractor's** or **Subcontractor's** noncompliance with this Article 37.4 and Labor Law Section 220 may result in an unsatisfactory performance evaluation and the **Comptroller** may also find and determine that the **Contractor** or **Subcontractor** willfully violated the New York Labor Law.

37.4.4(a) An unsatisfactory performance evaluation for noncompliance with this Article 37.4 may result in a determination that the **Contractor** is a non-responsible bidder on subsequent procurements with the **City** and thus a rejection of a future award of a contract with the **City**, as well as any other sanctions provided for by Law.

37.4.4(b) Labor Law Section 220-b, as amended, provides that when two (2) final determinations have been rendered against a **Contractor** or **Subcontractor** within any consecutive six (6) year period determining that such **Contractor** or **Subcontractor** has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with the Labor Law and this Article 37.4, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public works projects are rendered simultaneously, such **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the second final determination. If the final determination involves the falsification of payroll records or the kickback of wages or supplements, the **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the first final determination.

37.4.4(c) Labor Law Section 220, as amended, provides that the **Contractor** or **Subcontractor** found to have violated this Article 37.4 may be directed to make payment of wages or supplements including interest found to be due, and the **Contractor** or **Subcontractor** may be directed to make payment of a further sum as a civil penalty in an amount not exceeding twenty-five (25%) percent of the total amount found to be due.

37.5 The **Contractor** and its **Subcontractors** shall within ten (10) **Days** after mailing of a Notice of Award or written order, post in prominent and conspicuous places in each and every plant, factory, building, and structure where employees of the **Contractor** and its **Subcontractors** engaged in the

performance of this **Contract** are employed, notices furnished by the **City**, in relation to prevailing wages and supplements, minimum wages, and other stipulations contained in Sections 220 and 220-h of the Labor Law, and the **Contractor** and its **Subcontractors** shall continue to keep such notices posted in such prominent and conspicuous places until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services required to be furnished or rendered under this **Contract**.

37.6 The **Contractor** shall strictly comply with all of the provisions of Articles 37.6.1 through 37.6.5, and provide for all workers, laborers or mechanics in its employ, the following:

37.6.1 Notices Posted At **Site**: Post, in a location designated by the **City**, schedules of prevailing wages and supplements for this **Project**, a copy of all re-determinations of such schedules for the **Project**, the Workers' Compensation **Law** Section 51 notice, all other notices required by **Law** to be posted at the **Site**, the **City** notice that this **Project** is a public works project on which each worker is entitled to receive the prevailing wages and supplements for the occupation at which he or she is working, and all other notices which the **City** directs the **Contractor** to post. The **Contractor** shall provide a surface for such notices which is satisfactory to the **City**. The **Contractor** shall maintain and keep current such notices in a legible manner and shall replace any notice or schedule which is damaged, defaced, illegible or removed for any reason. The **Contractor** shall post such notices before commencing any **Work** on the **Site** and shall maintain such notices until all **Work** on the **Site** is complete; and

37.6.2 Daily **Site** Sign-in Sheets: Maintain daily **Site** sign-in sheets, and require that **Subcontractors** maintain daily **Site** sign-in sheets for its employees, which include blank spaces for an employee's name to be both printed and signed, job title, date started and Social Security number, the time the employee began work and the time the employee left work, until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services to be furnished or rendered under this **Contract** unless exception is granted by the **Comptroller** upon application by the **Agency**. In the alternative, subject to the approval of the **CCPO**, the **Contractor** and **Subcontractor** may maintain an electronic or biometric sign-in system, which provides the information required by this Article 37.6.2; and

37.6.3 Individual Employee Information Notices: Distribute a notice to each worker, laborer or mechanic employed under this **Contract**, in a form provided by the **Agency**, that this **Project** is a public works project on which each worker, laborer or mechanic is entitled to receive the prevailing rate of wages and supplements for the occupation at which he or she is working. If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand (\$250,000) dollars, such notice shall also include a statement that each worker, laborer or mechanic must be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration. Such notice shall be distributed to each worker before he or she starts performing any **Work** of this **Contract** and with the first paycheck after July first of each year. "Worker, laborer or mechanic" includes employees of the **Contractor** and all **Subcontractors** and all employees of suppliers entering the **Site**. At the time of distribution, the **Contractor** shall have each worker, laborer or mechanic sign a statement, in a form provided by the **Agency**, certifying that the worker has received the notice required by this Article 37.6.3, which signed statement shall be maintained with the payroll records required by this **Contract**; and

37.6.3(a) The **Contractor** and each **Subcontractor** shall notify each worker, laborer or mechanic employed under this **Contract** in writing of the prevailing rate of

wages for their particular job classification. Such notification shall be given to every worker, laborer, and mechanic on their first pay stub and with every pay stub thereafter; and

37.6.4 **Site Laminated Identification Badges:** The **Contractor** shall provide laminated identification badges which include a photograph of the worker's, laborer's or mechanic's face and indicate the worker's, laborer's or mechanic's name, trade, employer's name, and employment starting date (month/day/year). Further, the **Contractor** shall require as a condition of employment on the **Site**, that each and every worker, laborer or mechanic wear the laminated identification badge at all times and that it may be seen by any representative of the **City**. The **Commissioner** may grant a written waiver from the requirement that the laminated identification badge include a photograph if the **Contractor** demonstrates that the identity of an individual wearing a laminated identification badge can be easily verified by another method; and

37.6.5 **Language Other Than English Used On Site:** Provide the **ACCO** notice when three (3) or more employees (worker and/or laborer and/or mechanic) on the **Site**, at any time, speak a language other than English. The **ACCO** will then provide the **Contractor** the notices described in Article 37.6.1 in that language or languages as may be required. The **Contractor** is responsible for all distributions under this Article 37; and

37.6.6 **Provision of Records:** The **Contractor** and **Subcontractor(s)** shall produce within five (5) **Days** on the **Site** of the **Work** and upon a written order of the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, or the **Comptroller**, such records as are required to be kept by this Article 37.6; and

37.6.7 The **Contractor** and **Subcontractor(s)** shall pay employees by check or direct deposit. If this **Contract** is for an amount greater than one million (\$1,000,000) dollars, checks issued by the **Contractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the **Agency**). For any subcontract for an amount greater than seven hundred fifty thousand (\$750,000) dollars, checks issued by a **Subcontractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the **Agency**); and

37.6.8 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 37.6.1 through 37.6.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

37.7 The **Contractor** and its **Subcontractors** shall keep such employment and payroll records as are required by Section 220 of the Labor Law. The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of this Article 37.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

37.8 At the time the **Contractor** makes application for each partial payment and for final payment, the **Contractor** shall submit to the **Commissioner** a written payroll certification, in the form provided by this **Contract**, of compliance with the prevailing wage, minimum wage, and other provisions and stipulations required by Labor Law Section 220 and of compliance with the training requirements of Labor Law Section 220-h set forth in Article 35.2. This certification of compliance shall be a condition precedent to payment and no payment shall be made to the **Contractor** unless and until each such certification shall have been submitted to and received by the **Commissioner**.

37.9 This **Contract** is executed by the **Contractor** with the express warranty and representation that the **Contractor** is not disqualified under the provisions of Section 220 of the Labor Law from the award of the **Contract**.

37.10 Any breach or violation of any of the foregoing shall be deemed a breach or violation of a material provision of this **Contract**, and grounds for cancellation thereof by the **City**.

### **ARTICLE 38. PAYROLL REPORTS**

38.1 The **Contractor** and its **Subcontractor(s)** shall maintain on the **Site** during the performance of the **Work** the original payrolls or transcripts thereof which the **Contractor** and its **Subcontractor(s)** are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) **Days** after issuance of its first payroll, and every thirty (30) **Days** thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment requisitions.

38.2 The **Contractor** shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the **Work** on this **Contract**. If such payrolls and transcripts are maintained outside of New York City after the completion of the **Work** and their production is required pursuant to this Article 38, the **Contractor** shall produce such records in New York City upon request by the **City**.

38.3 The **Contractor** and **Subcontractor(s)** shall comply with any written order, direction, or request made by the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)**, or the **Comptroller**, to provide to the requesting party any of the following information and/or records within five (5) **Days** of such written order, direction, or request:

38.3.1 Such original payrolls or transcripts thereof subscribed and affirmed by it as true and the statements signed by each worker pursuant to this Chapter VIII; and/or

38.3.2 Attendance sheets for each **Day** on which any employee of the **Contractor** and/or any of the **Subcontractor(s)** performed **Work** on the **Site**, which attendance sheet shall be in a form acceptable to the **Agency** and shall provide information acceptable to the **Agency** to identify each such employee; and/or

38.3.3 Any other information to satisfy the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)** or the **Comptroller**, that this Chapter VIII and the Labor Law, as to the hours of employment and prevailing rates of wages and/or supplemental benefits, are being observed.

38.4 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 38.1 and/or 38.2 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

### **ARTICLE 39. DUST HAZARDS**

39.1 Should a harmful dust hazard be created in performing the **Work** of this **Contract**, for the elimination of which appliances or methods have been approved by the Board of Standards and Appeals

of the City of New York, such appliances and methods shall be installed, maintained, and effectively operated during the continuance of such harmful dust hazard. Failure to comply with this provision after notice shall make this **Contract** voidable at the sole discretion of the **City**.

## **CHAPTER IX: PARTIAL AND FINAL PAYMENTS**

### **ARTICLE 40. CONTRACT PRICE**

40.1 The **City** shall pay, and the **Contractor** agrees to accept, in full consideration for the **Contractor's** performance of the **Work** subject to the terms and conditions hereof, the lump sum price or unit prices for which this **Contract** was awarded, plus the amount required to be paid for any **Extra Work** ordered by the **Commissioner** under Article 25, less credit for any **Work** omitted pursuant to Article 29.

### **ARTICLE 41. BID BREAKDOWN ON LUMP SUM**

41.1 Within fifteen (15) **Days** after the commencement date specified in the **Notice to Proceed** or **Order to Work**, unless otherwise directed by the **Resident Engineer**, the **Contractor** shall submit to the **Resident Engineer** a breakdown of its bid price, or of lump sums bid for items of the **Contract**, showing the various operations to be performed under the **Contract**, as directed in the progress schedule required under Article 9, and the value of each of such operations, the total of such items to equal the lump sum price bid. Said breakdown must be approved in writing by the **Resident Engineer**.

41.2 No partial payment will be approved until the **Contractor** submits a bid breakdown that is acceptable to the **Resident Engineer**.

41.3 The **Contractor** shall also submit such other information relating to the bid breakdown as directed by the **Resident Engineer**. Thereafter, the breakdown may be used only for checking the **Contractor's** applications for partial payments hereunder, but shall not be binding upon the **City**, the **Commissioner**, or the **Engineer** for any purpose whatsoever.

### **ARTICLE 42. PARTIAL PAYMENTS**

42.1 From time to time as the **Work** progresses satisfactorily, but not more often than once each calendar month (except where the **Commissioner** approves in writing the submission of invoices on a more frequent basis and for invoices relating to **Work** performed pursuant to a change order), the **Contractor** may submit to the **Engineer** a requisition for a partial payment in the prescribed form, which shall contain an estimate of the quantity and the fair value of the **Work** done during the payment period.

42.2 Partial payments may be made for materials, fixtures, and equipment in advance of their actual incorporation in the **Work**, as the **Commissioner** may approve, and upon the terms and conditions set forth in the General Conditions.

42.3 The **Contractor** shall also submit to the **Commissioner** in connection with every application for partial payment a verified statement in the form prescribed by the **Comptroller** setting forth the information required under Labor Law Section 220-a.

42.4 Within thirty (30) **Days** after receipt of a satisfactory payment application, and within sixty (60) **Days** after receipt of a satisfactory payment application in relation to **Work** performed pursuant to a change order, the **Engineer** will prepare and certify, and the **Commissioner** will approve, a voucher for a partial payment in the amount of such approved estimate, less any and all deductions authorized to be made by the **Commissioner** under the terms of this **Contract** or by **Law**.

#### ARTICLE 43. PROMPT PAYMENT

43.1 The Prompt Payment provisions of the **PPB** Rules in effect at the time of the bid will be applicable to payments made under this **Contract**. The provisions require the payment to the **Contractor** of interest on payments made after the required payment date, except as set forth in the **PPB** Rules.

43.2 The **Contractor** shall submit a proper invoice to receive payment, except where the **Contract** provides that the **Contractor** will be paid at predetermined intervals without having to submit an invoice for each scheduled payment.

43.3 Determination of interest due will be made in accordance with the **PPB** Rules.

43.4 If the **Contractor** is paid interest, the proportionate share(s) of that interest shall be forwarded by the **Contractor** to its **Subcontractor(s)**.

43.5 The **Contractor** shall pay each **Subcontractor** or **Materialman** not later than seven (7) **Days** after receipt of payment out of amounts paid to the **Contractor** by the **City** for **Work** performed by the **Subcontractor** or **Materialman** under this **Contract**.

43.5.1 If **Contractor** fails to make any payment to any **Subcontractor** or **Materialman** within seven (7) **Days** after receipt of payment by the **City** pursuant to this Article 43.5, then the **Contractor** shall pay interest on amounts due to such **Subcontractor** or **Materialman** at the rate of interest in effect on the date such payment is made by the **Contractor** computed in accordance with Section 756-b (1)(b) of the New York General Business Law. Accrual of interest shall commence on the **Day** immediately following the expiration of the seventh **Day** following receipt of payment by the **Contractor** from the **City** and shall end on the date on which payment is made.

43.6 The **Contractor** shall include in each of its subcontracts a provision requiring each **Subcontractor** to make payment to each of its **Subcontractors** or **Materialmen** for **Work** performed under this **Contract** in the same manner and within the same time period set forth above.

#### ARTICLE 44. SUBSTANTIAL COMPLETION PAYMENT

44.1 The **Contractor** shall submit with the **Substantial Completion** requisition:

44.1.1 A final verified statement of any pending Article 27 disputes in accordance with the **PPB** Rules and this **Contract** and any and all alleged claims against the **City**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the

**Contractor** claims the performance of the **Work** or a particular part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay.

44.1.1(a) With respect to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City** Corporation Counsel shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 44.1.1(a) is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor** upon acceptance of the **Substantial Completion** payment pursuant to this Article 44, will have waived any such claims.

44.1.2 A **Final Approved Punch List**.

44.1.3 Where required, a request for an extension of time to achieve **Substantial Completion** or final extension of time.

44.2 The **Commissioner** shall issue a voucher calling for payment of any part or all of the balance due for **Work** performed under the **Contract**, including monies retained under Article 21, less any and all deductions authorized to be made by the **Commissioner**, under this **Contract** or by **Law**, and less twice the amount the **Commissioner** considers necessary to ensure the completion of the balance of the **Work** by the **Contractor**. Such a payment shall be considered a partial and not a final payment. No **Substantial Completion** payment shall be made under this Article 44 where the **Contractor** failed to complete the **Work** within the time fixed for such completion in the Schedule A of the General Conditions, or within the time to which completion may have been extended, until an extension or extensions of time for the completion of **Work** have been acted upon pursuant to Article 13.

44.3 No further partial payments shall be made to the **Contractor** after **Substantial Completion**, except the **Substantial Completion** payment and payment pursuant to any **Contractor's** requisition that were properly filed with the **Commissioner** prior to the date of **Substantial Completion**; however, the **Commissioner** may grant a waiver for further partial payments after the date of **Substantial Completion** to permit payments for change order **Work** and/or release of retainage and deposits pursuant to Articles 21 and 24. Such waiver shall be in writing.

44.4 The **Contractor** acknowledges that nothing contained in this Article 44 is intended to or shall in any way diminish the force and effect of Article 13.

#### **ARTICLE 45. FINAL PAYMENT**

45.1 After completion and **Final Acceptance** of the **Work**, the **Contractor** shall submit all required certificates and documents, together with a requisition for the balance claimed to be due under the **Contract**, less the amount authorized to be retained for maintenance under Article 24. Such submission shall be within 90 days of the date of the **Commissioner's** written determination of **Final Acceptance**, or within such additional time as may be granted by the **Commissioner** in writing. If the **Contractor** fails to submit all required certificates and documents within the time allowed, no payment of the balance claimed shall be made to the **Contractor** and the **Contractor** shall be deemed to have forfeited its right to payment of any balance claimed. A verified statement similar to that required in connection with applications for partial payments shall also be submitted to the **Commissioner**.

45.2 Amended Verified Statement of Claims: The **Contractor** shall also submit with the final requisition any amendments to the final verified statement of any pending dispute resolution procedures in accordance with the **PPB** Rules and this **Contract** and any and all alleged claims against the **City**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) that have occurred subsequent to **Substantial Completion**, setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each such item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the **Contractor** claims the performance of the **Work** or a particular part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay. With reference to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City Corporation Counsel** shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 45.2, is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor**, upon acceptance of the Final Payment pursuant to Article 46, will have waived any such claims.

45.3 Preparation of Final Voucher: Upon determining the balance due hereunder other than on account of claims, the **Engineer** will prepare and certify, for the **Commissioner's** approval, a voucher for final payment in that amount less any and all deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**. In the case of a lump sum **Contract**, the **Commissioner** shall certify the voucher for final payment within thirty (30) **Days** from the date of completion and acceptance of the **Work**, provided all requests for extensions of time have been acted upon.

45.3.1 All prior certificates and vouchers upon which partial payments were made, being merely estimates made to enable the **Contractor** to prosecute the **Work** more advantageously, shall be subject to correction in the final voucher, and the certification of the **Engineer** thereon and the approval of the **Commissioner** thereof, shall be conditions precedent to the right of the **Contractor** to receive any money hereunder. Such final voucher shall be binding and conclusive upon the **Contractor**.

45.3.2 Payment pursuant to such final voucher, less any deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**, shall constitute the final payment, and shall be made by the **Comptroller** within thirty (30) **Days** after the filing of such voucher in his/her office.

45.4 The **Contractor** acknowledges that nothing contained in this Article 45 is intended to or shall in any way diminish the force and effect of Article 13.

#### **ARTICLE 46. ACCEPTANCE OF FINAL PAYMENT**

46.1 The acceptance by the **Contractor**, or by anyone claiming by or through it, of the final payment, whether such payment be made pursuant to any judgment of any court, or otherwise, shall constitute and operate as a release of the **City** from any and all claims of and liability to the **Contractor** for anything heretofore done or furnished for the **Contractor** relating to or arising out of this **Contract** and the **Work** done hereunder, and for any prior act, neglect or default on the part of the **City** or any of its officials, agents or employees, excepting only a claim against the **City** for the amounts deducted or retained in accordance with the terms and provisions of this **Contract** or by **Law**, and excepting any claims, not otherwise waived, or any pending dispute resolution procedures which are contained in the

verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44 and 45.

46.2 The **Contractor** is warned that the execution by it of a release, in connection with the acceptance of the final payment, containing language purporting to reserve claims other than those herein specifically excepted from the operation of this Article 46, or those for amounts deducted by the **Commissioner** from the final requisition or from the final payment as certified by the **Engineer** and approved by the **Commissioner**, shall not be effective to reserve such claims, anything stated to the **Contractor** orally or in writing by any official, agent or employee of the **City** to the contrary notwithstanding.

46.3 Should the **Contractor** refuse to accept the final payment as tendered by the **Comptroller**, it shall constitute a waiver of any right to interest thereon.

46.4 The **Contractor**, however, shall not be barred by this Article 46 from commencing an action for breach of **Contract** to the extent permitted by **Law** and by the terms of the **Contract** for any claims that are contained in the verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44 and 45 or that arose after submission of the final payment requisition, provided that a detailed and verified statement of claim is served upon the contracting **Agency** and **Comptroller** not later than forty (40) **Days** after the making of such final payment by electronic funds transfer (EFT) or the mailing of such final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

#### **ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION**

47.1 All works of art, including paintings, mural decorations, stained glass, statues, bas-reliefs, and other sculptures, monuments, fountains, arches, and other structures of a permanent character intended for ornament or commemoration, and every design of the same to be used in the performance of this **Contract**, and the design of all bridges, approaches, buildings, gates, fences, lamps, or structures to be erected, pursuant to the terms of this **Contract**, shall be submitted to the Art Commission, d/b/a the Public Design Commission of the City of New York, and shall be approved by the Public Design Commission prior to the erection or placing in position of the same. The final payment shall not become due or payable under this **Contract** unless and until the Public Design Commission shall certify that the design for the **Work** herein contracted for has been approved by the said Public Design Commission, and that the same has been executed in substantial accordance with the design so approved, pursuant to the provisions of Chapter 37, Section 854 of the **City Charter**, as amended.

### **CHAPTER X: CONTRACTOR'S DEFAULT**

#### **ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT**

48.1 In addition to those instances specifically referred to in other Articles herein, the **Commissioner** shall have the right to declare the **Contractor** in default of this **Contract** if:

48.1.1 The **Contractor** fails to commence **Work** when notified to do so by the **Commissioner**; or if

48.1.2 The **Contractor** shall abandon the **Work**; or if

48.1.3 The **Contractor** shall refuse to proceed with the **Work** when and as directed by the **Commissioner**; or if

48.1.4 The **Contractor** shall, without just cause, reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the **Commissioner**, to complete the **Work** in accordance with the progress schedule; or if

48.1.5 The **Contractor** shall fail or refuse to increase sufficiently such working force when ordered to do so by the **Commissioner**; or if

48.1.6 The **Contractor** shall sublet, assign, transfer, convert or otherwise dispose of this **Contract** other than as herein specified; or sell or assign a majority interest in the **Contractor**; or if

48.1.7 The **Contractor** fails to secure and maintain all required insurance; or if

48.1.8 A receiver or receivers are appointed to take charge of the **Contractor's** property or affairs; or if

48.1.9 The **Commissioner** shall be of the opinion that the **Contractor** is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the **Work**, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

48.1.10 The **Commissioner** shall be of the opinion that the **Contractor** is or has been willfully or in bad faith violating any of the provisions of this **Contract**; or if

48.1.11 The **Commissioner** shall be of the opinion that the **Work** cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the **Commissioner's** opinion, attributable to conditions within the **Contractor's** control; or if

48.1.12 The **Work** is not completed within the time herein provided therefor or within the time to which the **Contractor** may be entitled to have such completion extended; or if

48.1.13 Any statement or representation of the **Contractor** in the **Contract** or in any document submitted by the **Contractor** with respect to the **Work**, the **Project**, or the **Contract** (or for purposes of securing the **Contract**) was untrue or incorrect when made; or if

48.1.14 The **Contractor** or any of its officers, directors, partners, five (5%) percent shareholders, principals, or other persons substantially involved in its activities, commits any of the acts or omissions specified as the grounds for debarment in the **PPB Rules**.

48.2 Before the **Commissioner** shall exercise his/her right to declare the **Contractor** in default, the **Commissioner** shall give the **Contractor** an opportunity to be heard, upon not less than two (2) **Days'** notice.

#### ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT

49.1 The right to declare the **Contractor** in default for any of the grounds specified or referred to in Article 48 shall be exercised by sending the **Contractor** a notice, signed by the **Commissioner**, setting forth the ground or grounds upon which such default is declared (hereinafter referred to as a "Notice of Default").

49.2 The **Commissioner's** determination that the **Contractor** is in default shall be conclusive, final, and binding on the parties and such a finding shall preclude the **Contractor** from commencing a plenary action for any damages relating to the **Contract**. If the **Contractor** protests the determination of the **Commissioner**, the **Contractor** may commence an action in a court of competent jurisdiction of the State of New York under Article 78 of the New York Civil Practice Law and Rules.

#### ARTICLE 50. QUITTING THE SITE

50.1 Upon receipt of such notice the **Contractor** shall immediately discontinue all further operations under this **Contract** and shall immediately quit the **Site**, leaving untouched all plant, materials, equipment, tools, and supplies then on the **Site**.

#### ARTICLE 51. COMPLETION OF THE WORK

51.1 The **Commissioner**, after declaring the **Contractor** in default, may then have the **Work** completed by such means and in such manner, by contract with or without public letting, or otherwise, as he/she may deem advisable, utilizing for such purpose such of the **Contractor's** plant, materials, equipment, tools, and supplies remaining on the **Site**, and also such **Subcontractors**, as he/she may deem advisable.

51.2 After such completion, the **Commissioner** shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and also the total amount of liquidated damages (at the rate provided for in the **Contract**) from the date when the **Work** should have been completed by the **Contractor** in accordance with the terms hereof to the date of actual completion of the **Work**. Such certificate shall be binding and conclusive upon the **Contractor**, its sureties, and any person claiming under the **Contractor**, as to the amount thereof.

51.3 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, and any liquidated damages assessed against the **Contractor**, shall be charged against and deducted out of monies which are earned by the **Contractor** prior to the date of default. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

#### ARTICLE 52. PARTIAL DEFAULT

52.1 In case the **Commissioner** shall declare the **Contractor** in default as to a part of the **Work** only, the **Contractor** shall discontinue such part, shall continue performing the remainder of the **Work** in strict conformity with the terms of this **Contract**, and shall in no way hinder or interfere with any **Other Contractor(s)** or persons whom the **Commissioner** may engage to complete the **Work** as to which the **Contractor** was declared in default.

52.2 The provisions of this Chapter relating to declaring the **Contractor** in default as to the entire **Work** shall be equally applicable to a declaration of partial default, except that the **Commissioner** shall be entitled to utilize for completion of the part of the **Work** as to which the **Contractor** was declared in default only such plant, materials, equipment, tools, and supplies as had been previously used by the **Contractor** on such part.

### **ARTICLE 53. PERFORMANCE OF UNCOMPLETED WORK**

53.1 In completing the whole or any part of the **Work** under the provisions of this Chapter X, the **Commissioner** shall have the power to depart from or change or vary the terms and provisions of this **Contract**, provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the **Commissioner's** certificate of the cost of completion referred to in Article 51, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the **Contractor** hereunder but for its default.

### **ARTICLE 54. OTHER REMEDIES**

54.1 In addition to the right to declare the **Contractor** in default pursuant to this Chapter X, the **Commissioner** shall have the absolute right, in his/her sole discretion and without a hearing, to complete or cause to be completed in the same manner as described in Articles 51 and 53, any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the **Final Approved Punch List**. A written notice of the exercise of this right shall be sent to the **Contractor** who shall immediately quit the **Site** in accordance with the provisions of Article 50.

54.2 The expense of completion permitted under Article 54.1, including any and all related and incidental costs, as so certified by the **Commissioner**, shall be charged against and deducted out of monies which have been earned by the **Contractor** prior to the date of the exercise of the right set forth in Article 54.1; the balance of such monies, if any, subject to the other provisions of this **Contract**, to be paid to the **Contractor** without interest after such completion. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

54.3 The previous provisions of this Chapter X shall be in addition to any and all other remedies available under **Law** or in equity.

54.4 The exercise by the **City** of any remedy set forth herein shall not be deemed a waiver by the **City** of any other legal or equitable remedy contained in this **Contract** or provided under **Law**.

## **CHAPTER XI: MISCELLANEOUS PROVISIONS**

### **ARTICLE 55. CONTRACTOR'S WARRANTIES**

55.1 In consideration of, and to induce, the award of this **Contract** to the **Contractor**, the **Contractor** represents and warrants:

55.1.1 That it is financially solvent, sufficiently experienced and competent to perform the **Work**; and

55.1.2 That the facts stated in its bid and the information given by it pursuant to the Information for Bidders is true and correct in all respects; and

55.1.3 That it has read and complied with all requirements set forth in the **Contract**.

#### **ARTICLE 56. CLAIMS AND ACTIONS THEREON**

56.1 Any claim, that is not subject to dispute resolution under the **PPB** Rules or this **Contract**, against the **City** for damages for breach of **Contract** shall not be made or asserted in any action, unless the **Contractor** shall have strictly complied with all requirements relating to the giving of notice and of information with respect to such claims, as herein before provided.

56.2 Nor shall any action be instituted or maintained on any such claims unless such action is commenced within six (6) months after **Substantial Completion**; except that:

56.2.1 Any claims arising out of events occurring after **Substantial Completion** and before **Final Acceptance** of the **Work** shall be asserted within six (6) months of **Final Acceptance** of the **Work**;

56.2.2 If the **Commissioner** exercises his/her right to complete or cause to complete any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the **Final Approved Punch List** pursuant to Article 54, any such action shall be commenced within six (6) months from the date the **Commissioner** notifies the **Contractor** in writing that he/she has exercised such right. Any claims for monies deducted, retained or withheld under the provisions of this **Contract** shall be asserted within six (6) months after the date when such monies otherwise become due and payable hereunder; and

56.2.3 If the **Commissioner** exercises his/her right to terminate the **Contract** pursuant to Article 64, any such action shall be commenced within six (6) months of the date the **Commissioner** exercises said right.

#### **ARTICLE 57. INFRINGEMENT**

57.1 The **Contractor** shall be solely responsible for and shall defend, indemnify, and hold the **City** harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the **City** may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the **Contractor** of any copyright, trade secrets, trademark or patent rights or any other property or personal right of any third party by the **Contractor** and/or its **Subcontractors** in the performance or completion of the **Work**. Insofar as the facts or **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent permitted by **Law**.

## ARTICLE 58. NO CLAIM AGAINST OFFICIALS, AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the **Contractor** against any official, agent or employee of the **City** for, or on account of, anything done or omitted to be done in connection with this **Contract**.

## ARTICLE 59. SERVICE OF NOTICES

59.1 The **Contractor** hereby designates the business address, fax number, and email address specified in its bid, as the place where all notices, directions or other communications to the **Contractor** may be delivered, or to which they may be mailed. Any notice, direction, or communication from either party to the other shall be in writing and shall be deemed to have been given when (i) delivered personally; (ii) sent by certified mail, return receipt requested; (iii) delivered by overnight or same day courier service in a properly addressed envelope with confirmation; or (iv) sent by fax or email and, unless receipt of the fax or e-mail is acknowledged by the recipient by fax or e-mail, deposited in a post office box regularly maintained by the United States Postal Service in a properly addressed, postage pre-paid envelope.

59.2 **Contractor's** notice address, email address, or fax number may be changed at any time by an instrument in writing, executed and acknowledged by the **Contractor**, and delivered to the **Commissioner**.

59.3 Nothing herein contained shall, however, be deemed to preclude or render inoperative the service of any notice, direction or other communication upon the **Contractor** personally, or, if the **Contractor** is a corporation, upon any officer thereof.

## ARTICLE 60. UNLAWFUL PROVISIONS DEEMED STRICKEN FROM CONTRACT

60.1 If this **Contract** contains any unlawful provision not an essential part of the **Contract** and which shall not appear to have been a controlling or material inducement to the making thereof, the same shall be deemed of no effect and shall, upon notice by either party, be deemed stricken from the **Contract** without affecting the binding force of the remainder.

## ARTICLE 61. ALL LEGAL PROVISIONS DEEMED INCLUDED

61.1 It is the intent and understanding of the parties to this **Contract** that each and every provision of **Law** required to be inserted in this **Contract** shall be and is inserted herein. Furthermore, it is hereby stipulated that every such provision is to be deemed to be inserted herein, and if, through mistake or otherwise, any such provision is not inserted, or is not inserted in correct form, then this **Contract** shall forthwith upon the application of either party be amended by such insertion so as to comply strictly with the **Law** and without prejudice to the rights of either party hereunder.

## ARTICLE 62. TAX EXEMPTION

62.1 The **City** is exempt from payment of Federal, State, and local taxes, including sales and compensating use taxes of the State of New York and its cities and counties on all tangible personal property sold to the **City** pursuant to the provisions of this **Contract**. These taxes are not to be included in bids. However, this exemption does not apply to tools, machinery, equipment or other property leased by or to the **Contractor**, **Subcontractor** or **Materialman** or to tangible personal property which, even

though it is consumed, is not incorporated into the completed **Work** (consumable supplies) and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**. The **Contractor** and its **Subcontractors** and **Materialmen** shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property and upon all such consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**.

62.2 The **Contractor** agrees to sell and the **City** agrees to purchase all tangible personal property, other than consumable supplies and other tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**, that is required, necessary or proper for or incidental to the construction of the **Project** covered by this **Contract**. The sum paid under this **Contract** for such tangible personal property shall be in full payment and consideration for the sale of such tangible personal property.

62.2.1 The **Contractor** agrees to construct the **Project** and to perform all **Work**, labor and services rendered, necessary, proper or incidental thereto for the sum shown in the bid for the performance of such **Work**, labor, and services, and the sum so paid pursuant to this **Contract** for such **Work**, labor, and services, shall be in full consideration for the performance by the **Contractor** of all its duties and obligations under this **Contract** in connection with said **Work**, labor, and services.

62.3 20 NYCRR Section 541.3(d) provides that a **Contractor's** purchases of tangible personal property that is either incorporated into real property owned by a governmental entity or purchased for and sold to a governmental entity are exempt from sales and use tax. The **City** shall not pay sales tax for any such tangible personal property that it purchases from the **Contractor** pursuant to the **Contract**. With respect to such tangible personal property, the **Contractor**, at the request of the **City**, shall furnish to the **City** such bills of sale and other instruments as may be required by the **City**, properly executed, acknowledged and delivered assuring to the **City** title to such tangible personal property, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such tangible personal property as the property of the **City**.

62.4 Title to all tangible personal property to be sold by the **Contractor** to the **City** pursuant to the provisions of the **Contract** shall immediately vest in and become the sole property of the **City** upon delivery of such tangible personal property to the **Site**. Notwithstanding such transfer of title, the **Contractor** shall have the full and continuing responsibility to install such tangible personal property in accordance with the provisions of this **Contract**, protect it, maintain it in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional tangible personal property in place of any that may be lost, stolen or rendered unusable, without cost to the **City**, until such time as the **Work** covered by the **Contract** is fully accepted by the **City**. Such transfer of title shall in no way affect any of the **Contractor's** obligations hereunder. In the event that, after title has passed to the **City**, any of the tangible personal property is rejected as being defective or otherwise unsatisfactory, title to all such tangible personal property shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** or **Materialmen** of tangible personal property to be sold hereunder shall be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid sales and compensating use taxes, provided that the subcontracts and purchase agreements provide for the resale of such tangible personal property and that such subcontracts and purchase agreements are in a form similar to this **Contract** with respect to the separation of the sale of consumable supplies and tangible personal property that the

**Contractor** is required to remove from the **Site** during or upon completion of the **Work** from the **Work** and labor, services, and any other matters to be provided, and provided further that the subcontracts and purchase agreements provide separate prices for tangible personal property and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for tangible personal property from the payments for other **Work** and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and **Materialmen** shall furnish a **Contractor** Exempt Purchase Certificate to all persons, firms or corporations from which they purchase tangible personal property for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this Article 62 shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this Article 62 shall control.

### ARTICLE 63. INVESTIGATION(S) CLAUSE

63.1 The parties to this **Contract** agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a United States, a State of New York (State) or a **City** governmental agency or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental agency that is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit or license that is the subject of the investigation, audit or inquiry.

63.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision or public authority thereof, or the Port Authority of New York and New Jersey, or any local development corporation within the **City**, or any public benefit corporation organized under the **Laws** of the State of New York, or;

63.3 If any person refuses to testify for a reason other than the assertion of his/her privilege against self incrimination in an investigation, audit or inquiry conducted by a **City** or State governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental agency that is a party in interest in, and is seeking testimony concerning the award of, or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision thereof or any local development corporation within the **City**, then;

63.4 The **Commissioner** whose **Agency** is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit, or license shall convene a hearing, upon not less than five (5) **Days'** written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

63.5 If any non-governmental party to the hearing requests an adjournment, the **Commissioner** who convened the hearing may, upon granting the adjournment, suspend any contract, lease, permit, or license, pending the final determination pursuant to Article 63.7 without the **City** incurring any penalty or damages for delay or otherwise.

63.6 The penalties which may attach after a final determination by the **Commissioner** may include but shall not exceed:

63.6.1 The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any contract, lease, permit or license with or from the **City**; and/or

63.6.2 The cancellation or termination of any and all such existing **City** contracts, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted under this **Contract**, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the **City** incurring any penalty or damages on account of such cancellation or termination; monies lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the **City**.

63.7 The **Commissioner** shall consider and address in reaching his/her determination and in assessing an appropriate penalty the factors in Articles 63.7.1 and 63.7.2. The **Commissioner** may also consider, if relevant and appropriate, the criteria established in Articles 63.7.3 and 63.7.4, in addition to any other information which may be relevant and appropriate:

63.7.1 The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

63.7.2 The relationship of the person who refused to testify to any entity that is a party to the hearing, including but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility the person has within the entity.

63.7.3 The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses with the **City**.

63.7.4 The effect a penalty may have on an unaffiliated and unrelated party or entity that has a significant interest in an entity subject to penalties under Article 63.6, provided that the party or entity has given actual notice to the **Commissioner** upon the acquisition of the interest, or at the hearing called for in Article 63.4, gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity shall present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

63.8 Definitions:

63.8.1 The term "license" or "permit" as used in this Article 63 shall be defined as a license, permit, franchise or concession not granted as a matter of right.

63.8.2 The term "person" as used in this Article 63 shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

63.8.3 The term "entity" as used in this Article 63 shall be defined as any firm, partnership, corporation, association, joint venture, or person that receives monies, benefits, licenses, leases, or permits from or through the City or otherwise transacts business with the City.

63.8.4 The term "member" as used in this Article 63 shall be defined as any person associated with another person or entity as a partner, director, officer, principal or employee.

63.9 In addition to and notwithstanding any other provision of this **Contract**, the **Commissioner** may in his/her sole discretion terminate this **Contract** upon not less than three (3) **Days**' written notice in the event the **Contractor** fails to promptly report in writing to the **Commissioner** of the Department of Investigations ("DOI") of the **City** any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the **City** or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this **Contract** by the **Contractor**, or affecting the performance of this **Contract**.

#### **ARTICLE 64. TERMINATION BY THE CITY**

64.1 In addition to termination pursuant to any other article of this **Contract**, the **Commissioner** may, at any time, terminate this **Contract** by written notice to the **Contractor**. In the event of termination, the **Contractor** shall, upon receipt of such notice, unless otherwise directed by the **Commissioner**:

64.1.1 Stop **Work** on the date specified in the notice;

64.1.2 Take such action as may be necessary for the protection and preservation of the **City's** materials and property;

64.1.3 Cancel all cancelable orders for material and equipment;

64.1.4 Assign to the **City** and deliver to the **Site** or another location designated by the **Commissioner**, any non-cancelable orders for material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract** and not incorporated in the **Work**;

64.1.5 Take no action which will increase the amounts payable by the **City** under this **Contract**.

64.2 In the event of termination by the **City** pursuant to this Article 64, payment to the **Contractor** shall be in accordance with Articles 64.2.1, 64.2.2 or 64.2.3, to the extent that each respective article applies.

64.2.1 Lump Sum Contracts or Items: On all lump sum **Contracts**, or on lump sum items in a **Contract**, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.1(a) and 64.2.1(b), less all payments previously made pursuant to this **Contract**. On lump sum **Contracts** only, the **City** will also pay the **Contractor** an additional sum as provided in Article 64.2.1(c).

64.2.1(a) For **Work** completed prior to the notice of termination, the **Contractor** shall be paid a pro rata portion of the lump sum bid amount, plus approved change orders, based upon the percent completion of the **Work**, as determined by the

**Commissioner.** For the purpose of determining the pro rata portion of the lump sum bid amount to which the **Contractor** is entitled, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be dispositive. The **Commissioner's** determination hereunder shall be final, binding, and conclusive.

64.2.1(b) For non-cancelable material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated in the **Work**, the **Contractor** shall be paid the lesser of the following, less salvage value:

64.2.1(b)(i) The Direct Cost, as defined in Article 64.2.4; or

64.2.1(b)(ii) The fair and reasonable value, if less than Direct Cost, of such material and equipment, plus necessary and reasonable delivery costs.

64.2.1(b)(iii) In addition, the **Contractor** shall be paid five (5%) percent of the amount described in Article 64.2.1(b)(i) or Article 64.2.1(b)(ii), whichever applies.

64.2.1(c) Except as otherwise provided in Article 64.2.1(d), on all lump sum **Contracts**, the **Contractor** shall be paid the percentage indicated below applied to the difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Articles 64.2.1(a) and 64.2.1(b):

64.2.1(c)(i) Five (5%) percent of the first five million (\$5,000,000) dollars; and

64.2.1(c)(ii) Three (3%) percent of any amount between five million (\$5,000,000) dollars and fifteen million (\$15,000,000) dollars; plus

64.2.1(c)(iii) One (1%) percent of any amount over fifteen million (\$15,000,000) dollars.

64.2.1(d) In the event the **City** terminates a lump sum **Contract** pursuant to this Article 64 within ninety (90) **Days** after registration of the **Contract** with the **Comptroller**, the **Contractor** shall be paid one (1%) percent of the difference between the lump sum bid amount and the total of all payments made pursuant to this Article 64.2.

64.2.2 Unit Price Contracts or Items: On all unit price **Contracts**, or on unit price items in a **Contract**, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.2(a) and 64.2.2(b), less all payments previously made pursuant to this **Contract**:

64.2.2(a) For all completed units, the unit price stated in the **Contract**, and

64.2.2(b) For units that have been ordered but are only partially completed, the **Contractor** will be paid:

64.2.2(b)(i) A pro rata portion of the unit price stated in the **Contract** based upon the percent completion of the unit and

64.2.2(b)(ii) For non-cancelable material and equipment, payment will be made pursuant to Article 64.2.1(b).

64.2.3 Time and Materials Contracts or Items Based on Time and Material Records: On all **Contracts** or items in a **Contract** where payment for the **Work** is based on time and material records, the **Contractor** shall be paid in accordance with Article 26, less all payments previously made pursuant to this **Contract**.

64.2.4 Direct Costs: Direct Costs as used in this Article 64.2 shall mean:

64.2.4(a) The actual purchase price of material and equipment, plus necessary and reasonable delivery costs,

64.2.4(b) The actual cost of labor involved in construction and installation at the **Site**, and

64.2.4(c) The actual cost of necessary bonds and insurance purchased pursuant to requirements of this **Contract** less any amounts that have been or should be refunded by the **Contractor's** sureties or insurance carriers.

64.2.4(d) Direct Costs shall not include overhead.

64.3 In no event shall any payments under this Article 64 exceed the **Contract** price for such items.

64.4 All payments pursuant to Article 64 shall be in the nature of liquidated damages and shall be accepted by the **Contractor** in full satisfaction of all claims against the **City**.

64.5 The **City** may deduct or set off against any sums due and payable pursuant to this Article 64, any deductions authorized by this **Contract** or by **Law** (including but not limited to liquidated damages) and any claims it may have against the **Contractor**. The **City's** exercise of the right to terminate the **Contract** pursuant to this Article 64 shall not impair or otherwise effect the **City's** right to assert any claims it may have against the **Contractor** in a plenary action.

64.6 Where the **Work** covered by the **Contract** has been substantially completed, as determined in writing by the **Commissioner**, termination of the **Work** shall be handled as an omission of **Work** pursuant to Articles 29 and 33, in which case a change order will be issued to reflect an appropriate reduction in the **Contract** sum, or if the amount is determined after final payment, such amount shall be paid by the **Contractor**.

#### **ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE**

65.1 This **Contract** shall be deemed to be executed in the **City** regardless of the domicile of the **Contractor**, and shall be governed by and construed in accordance with the **Laws** of the State of New York and the **Laws** of the United States, where applicable.

65.2 The parties agree that any and all claims asserted against the **City** arising under this **Contract** or related thereto shall be heard and determined in the courts of the State of New York ("New York State Courts") located in the **City** and County of New York. To effect this **Contract** and intent, the **Contractor** agrees:

65.2.1 If the **City** initiates any action against the **Contractor** in Federal court or in a New York State Court, service of process may be made on the **Contractor** either in person, wherever such **Contractor** may be found, or by registered mail addressed to the **Contractor** at its address as set forth in this **Contract**, or to such other address as the **Contractor** may provide to the **City** in writing; and

65.2.2 With respect to any action between the **City** and the **Contractor** in a New York State Court, the **Contractor** hereby expressly waives and relinquishes any rights it might otherwise have:

65.2.2(a) To move to dismiss on grounds of forum non conveniens;

65.2.2(b) To remove to Federal Court; and

65.2.2(c) To move for a change of venue to a New York State Court outside New York County.

65.2.3 With respect to any action brought by the **City** against the **Contractor** in a Federal Court located in the **City**, the **Contractor** expressly waives and relinquishes any right it might otherwise have to move to transfer the action to a Federal Court outside the **City**.

65.2.4 If the **Contractor** commences any action against the **City** in a court located other than in the **City** and County of New York, upon request of the **City**, the **Contractor** shall either consent to a transfer of the action to a New York State Court of competent jurisdiction located in the **City** and County of New York or, if the Court where the action is initially brought will not or cannot transfer the action, the **Contractor** shall consent to dismiss such action without prejudice and may thereafter reinstate the action in a New York State Court of competent jurisdiction in New York County.

65.3 If any provision(s) of this Article 65 is held unenforceable for any reason, each and all other provision(s) shall nevertheless remain in full force and effect.

#### **ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT**

66.1 The **Contractor** agrees that neither the **Contractor** nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the Federal Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce (Commerce Department) promulgated thereunder.

66.2 Upon the final determination by the Commerce Department or any other agency of the United States as to, or conviction of the **Contractor** or a substantially-owned affiliated company thereof for participation in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations promulgated thereunder, the **Comptroller** may, at his/her option, render forfeit and void this **Contract**.

66.3 The **Contractor** shall comply in all respects, with the provisions of Section 6-114 of the Administrative Code and the rules and regulations issued by the **Comptroller** thereunder.

## ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM

67.1 This **Contract** is subject to the requirements of Section 6-108.1 of the Administrative Code and regulations promulgated thereunder. No construction contract shall be awarded unless and until these requirements have been complied with in their entirety; however, compliance with this Article 67 is not required if the Agency sets Subcontractor Participation Goals for Minority- and Women-Owned Business Enterprises (M/WBEs).

67.2 Unless specifically waived by the **Commissioner** with the approval of the Division of Economic and Financial Opportunity of the **City** Department of Business Services, if any portion of the **Contract** is subcontracted, not less than ten (10%) percent of the total dollar amount of the **Contract** shall be awarded to locally based enterprises (LBEs); except that where less than ten (10%) percent of the total dollar amount of the **Contract** is subcontracted, such lesser percentage shall be so awarded.

67.3 The **Contractor** shall not require performance and payment bonds from LBE **Subcontractors**.

67.4 If the **Contractor** has indicated prior to award that no **Work** will be subcontracted, no **Work** shall be subcontracted without the prior approval of the **Commissioner**, which shall be granted only if the **Contractor** makes a good faith effort beginning at least six (6) weeks before the **Work** is to be performed to obtain LBE **Subcontractors** to perform the **Work**.

67.5 If the **Contractor** has not identified sufficient LBE **Subcontractors** prior to award, it shall sign a letter of compliance stating that it complies with Section 6-108.1 of the Administrative Code, recognizes that achieving the LBE requirement is a condition of its **Contract**, and shall submit documentation demonstrating its good faith efforts to obtain LBEs. After award, the **Contractor** shall begin to solicit LBE's to perform subcontracted **Work** at least six (6) weeks before the date such **Work** is to be performed and shall demonstrate that a good faith effort has been made to obtain LBEs on each subcontract until it meets the required percentage.

67.6 Failure of the **Contractor** to comply with the requirements of Section 6-108.1 of the Administrative Code and the regulations promulgated thereunder shall constitute a material breach of this **Contract**. Remedy for such breach may include the imposition of any or all of the following sanctions:

67.6.1 Reducing the **Contractor's** compensation by an amount equal to the dollar value of the percentage of the LBE subcontracting requirement not complied with;

67.6.2 Declaring the **Contractor** in default;

67.6.3 If the **Contractor** is an LBE, de-certifying and declaring the **Contractor** ineligible to participate in the LBE program for a period of up to three (3) years.

## ARTICLE 68. ANTITRUST

68.1 The **Contractor** hereby assigns, sells, and transfers to the **City** all right, title, and interest in and to any claims and causes of action arising under the antitrust **Laws** of New York State or of the United States relating to the particular goods or services purchased or procured by the **City** under this **Contract**.

## ARTICLE 69. MacBRIDE PRINCIPLES PROVISIONS

### 69.1 Notice To All Prospective **Contractors**:

69.1.1 Local Law No. 34 of 1991 became effective on September 10, 1991 and added Section 6-115.1 of the Administrative Code. The local **Law** provides for certain restrictions on **City Contracts** to express the opposition of the people of the **City** to employment discrimination practices in Northern Ireland to promote freedom of work-place opportunity.

69.1.2 Pursuant to Section 6-115.1, prospective **Contractors** for **Contracts** to provide goods or services involving an expenditure of an amount greater than ten thousand (\$10,000.) dollars, or for construction involving an amount greater than fifteen thousand (\$15,000.) dollars, are asked to sign a rider in which they covenant and represent, as a material condition of their **Contract**, that any business operations in Northern Ireland conducted by the **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** will be conducted in accordance with the MacBride Principles of nondiscrimination in employment.

69.1.3 Prospective **Contractors** are not required to agree to these conditions. However, in the case of **Contracts** let by competitive sealed bidding, whenever the lowest responsible bidder has not agreed to stipulate to the conditions set forth in this notice and another bidder who has agreed to stipulate to such conditions has submitted a bid within five (5%) percent of the lowest responsible bid for a **Contract** to supply goods, services or construction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable **Law**, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City Charter**.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City Council** shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling to and from **Work**;

69.3.1(c) ban provocative religious or political emblems from the workplace;

69.3.1(d) publicly advertise all job openings and make special recruitment efforts to attract applicants from under-represented religious groups;

69.3.1(e) establish layoff, recall, and termination procedures which do not in practice favor a particular religious group;

69.3.1(f) abolish all job reservations, apprenticeship restrictions and different employment criteria which discriminate on the basis of religion;

69.3.1(g) develop training programs that will prepare substantial numbers of current employees from under-represented religious groups for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade, and improve the skills of workers from under-represented religious groups;

69.3.1(h) establish procedures to assess, identify, and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative action efforts and develop a timetable to ensure their full implementation.

69.4 The **Contractor** agrees that the covenants and representations in Article 69.2 are material conditions to this **Contract**. In the event the **Agency** receives information that the **Contractor** who made the stipulation required by this Article 69 is in violation thereof, the **Agency** shall review such information and give the **Contractor** an opportunity to respond. If the **Agency** finds that a violation has occurred, the **Agency** shall have the right to declare the **Contractor** in default and/or terminate this **Contract** for cause and procure supplies, services or **Work** from another source in the manner the **Agency** deems proper. In the event of such termination, the **Contractor** shall pay to the **Agency**, or the **Agency** in its sole discretion may withhold from any amounts otherwise payable to the **Contractor**, the difference between the **Contract** price for the uncompleted portion of this **Contract** and the cost to the **Agency** of completing performance of this **Contract** either itself or by engaging another **Contractor** or **Contractors**. In the case of a requirement **Contract**, the **Contractor** shall be liable for such difference in price for the entire amount of supplies required by the **Agency** for the uncompleted term of **Contractor's Contract**. In the case of a construction **Contract**, the **Agency** shall also have the right to hold the **Contractor** in partial or total default in accordance with the default provisions of this **Contract**, and/or may seek debarment or suspension of the **Contractor**. The rights and remedies of the **Agency** hereunder shall be in addition to, and not in lieu of, any rights and remedies the **Agency** has pursuant to this **Contract** or by operation of **Law**.

## **ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB**

70.1 The **Contractor** shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the **City** Department of Buildings Web site at [www.nyc.gov/buildings](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 as shown in Schedule A.

## **ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR**

75.1 The **City** will pay and the **Contractor** will accept in full consideration for the performance of the **Contract**, subject to additions and deductions as provided herein, the total sum shown in Schedule A, this said sum being the amount at which the **Contract** was awarded to the **Contractor** at a public letting thereof, based upon the **Contractor's** bid for the **Contract**.

## **ARTICLE 76. ELECTRONIC FUNDS TRANSFER**

76.1 In accordance with Section 6-107.1 of the Administrative Code, the **Contractor** agrees to accept payments under this **Contract** from the **City** by electronic funds transfer (EFT). An EFT is any

transfer of funds, other than a transaction originated by check, draft or similar paper instrument, which is initiated through an electronic terminal, telephonic instrument or computer or magnetic tape so as to order, instruct or authorize a financial institution to debit or credit an account. Prior to the first payment made under this **Contract**, the **Contractor** shall designate one financial institution or other authorized payment agent and shall complete the attached "EFT Vendor Payment Enrollment Form" in order to provide the Commissioner of the **City** Department of Finance with information necessary for the **Contractor** to receive electronic funds transfer payments through a designated financial institution or authorized payment agent. The crediting of the amount of a payment to the appropriate account on the books of a financial institution or other authorized payment agent designated by the **Contractor** shall constitute full satisfaction by the **City** for the amount of the payment under this **Contract**. The account information supplied by the **Contractor** to facilitate the electronic funds transfer shall remain confidential to the fullest extent provided by **Law**.

76.2 The **Commissioner** may waive the application of the requirements of this Article 76 to payments on contracts entered into pursuant to Section 315 of the **City** Charter. In addition, the Commissioner of the Department of Finance and the Comptroller may jointly issue standards pursuant to which the **Agency** may waive the requirements of this Article 76 for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications or types of checks; or (iii) in other circumstances as may be necessary in the interest of the **City**.

#### **ARTICLE 77. RECORDS RETENTION**

77.1 The **Contractor** agrees to retain all books, records, and other documents relevant to this **Contract** for six years after the final payment or termination of this **Contract**, whichever is later. **City**, state, and federal auditors and any other persons duly authorized by the **City** shall have full access to and the right to examine any such books, records, and other documents during the retention period.

#### **ARTICLE 78. EXAMINATION AND VIEWING OF SITE, CONSIDERATION OF OTHER SOURCES OF INFORMATION AND CHANGED SITE CONDITIONS**

78.1 Pre-Bidding (Investigation) Viewing of Site – Bidders must carefully view and examine the **Site** of the proposed **Work**, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions and hazards on, about or above the **Site** relating to or affecting in any way the performance of the **Work** to be done under the **Contract** that were or should have been known by a reasonably prudent bidder. To arrange a date for visiting the **Site**, bidders are to contact the **Agency** contact person specified in the bid documents.

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

**ARTICLE 79. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED  
BUSINESS ENTERPRISES IN CITY PROCUREMENT**

**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 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: *Lorena Gallo*  
Commissioner

CONTRACTOR:

By: *[Signature]*  
(Member of Firm or Officer of Corporation)

Title: VP

(Where Contractor is a Corporation, add):  
Attest:

\_\_\_\_\_  
Secretary

(Seal)

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of New Jersey County of Passaic ss:

On this 3rd day of February, 2021, before me personally came Anthony Della Cerra to me known who, being by me duly sworn did depose and say that he resides at 507 Squaw Brook Road North Haledon, New Jersey 07508 that he is the Vice President of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

  
Notary Public or Commissioner of Deeds

**MARGUERITE WEMKEN**  
**NOTARY PUBLIC OF NEW JERSEY**  
**MY COMMISSION EXPIRES JULY 27, 2022**

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 or Commissioner of Deeds

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 or Commissioner of Deeds

ACKNOWLEDGEMENT BY COMMISSIONER

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, before me personally came \_\_\_\_\_ to me known, and known to be the Deputy 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 acknowledged to me that he executed the same as Deputy Commissioner for the purposes therein mentioned.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

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

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

Dollars (\$ \_\_\_\_\_)

is chargeable to the fund of the Department of Design and Construction entitled Code

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

Department of Design and Construction

I hereby certify that the specifications contained herein comply with the terms and conditions of the BUDGET.



\_\_\_\_\_  
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 100 to 103): 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;

**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

**Performance Bond #1 (Pages 100 to 103): 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)

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 100 to 103): 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 \_\_\_\_\_, 20\_\_\_\_.  
(Seal)

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

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 100 to 103): 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.m.**

PERFORMANCE BOND #1 (Page 4)

**ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION**

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_ before me personally came \_\_\_\_\_,  
to me known, who, being by me duly sworn did depose and say that he/she resides  
at \_\_\_\_\_

\_\_\_\_\_ ; that he/she is the \_\_\_\_\_  
of the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name to  
the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds.

**ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP**

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_ before me personally came \_\_\_\_\_,  
to me known, who, being by me duly sworn did depose and say that he/she resides  
at \_\_\_\_\_

\_\_\_\_\_ ; that he/she is \_\_\_\_\_ partner of  
\_\_\_\_\_, a limited/general partnership existing under the laws of the State of  
\_\_\_\_\_, the partnership described in and which executed the foregoing instrument;  
and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of  
said partnership.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds.

**ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL**

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_ before me personally came \_\_\_\_\_,  
to me known, who, being by me duly sworn did depose and say that he/she resides  
at \_\_\_\_\_

\_\_\_\_\_ , and that he/she is the individual whose name is  
subscribed to the within instrument and acknowledged to me that by his/her signature on the  
instrument, said individual executed the instrument.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\*\*\*\*\*

Affix Acknowledgments and Justification of Sureties.

**Performance Bond #2 (Pages 104 to 107): 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, \_\_\_\_\_  
Delric Construction Co., Inc.  
845 Belmont Avenue  
North Haledon, NJ 07508

hereinafter referred to as the "Principal,"  
and, \_\_\_\_\_  
Liberty Mutual Insurance Company  
175 Berkeley Street  
Boston, MA 02116

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum of Twenty Two Million Seven Hundred Ninety Six Thousand Seven Hundred Ninety Three and no/100 dollars

(\$ 22,796,793.00 ) 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

DSNY District SI-3 Garage & Repair Shop-HVAC System and Roof Replacement-Borough of Staten Island  
FMS ID: S136-383S; E-PIN: 85019B0092001; DDC Pin: 8502019TR0002C

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

**Performance Bond #2 (Pages 104 to 107): Use if the total contract price is more than \$5 Million.**

PERFORMANCE BOND #2 (Page 2)

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 104 to 107): 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

9<sup>th</sup> day of March 20<sup>20</sup>

(Seal)

Delric Construction Co., Inc. (L.S.)

Principal

(Seal)

By: [Signature]

Anthony Della Cerra, VP

Surety

(Seal)

By: Liberty Mutual Insurance Company

Thomas J. Herlihy  
Attorney-In-Fact Surety

(Seal)

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

Surety

(Seal)

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

Surety

(Seal)

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

Surety

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

Bond Premium Rate \$15.26 sliding scale

Bond Premium Cost \$ 154,508.00

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 104 to 107): Use if the total contract price is more than \$5 Million.**

PERFORMANCE BOND #2 (Page 4)

**ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION**

State of New Jersey County of Passaic ss:

On this 9th day of March, 2020 before me personally came Anthony Della Cerra

to me known, who, being by me duly sworn did depose and say that he resides at 507 Squaw Brook Rd North Haledon, NJ

; that he/she is the Vice President of the corporation described in and which executed the foregoing instrument; that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation by the authorized and binding act thereof.

Marguerite Wenden  
Notary Public or Commissioner of Deeds. **MARGUERITE WENDEN**  
**NOTARY PUBLIC OF NEW JERSEY**  
**MY COMMISSION EXPIRES JULY 27, 2022**

**ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP**

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ before me personally came \_\_\_\_\_

to me known, who, being by me duly sworn did depose and say that he/she resides at \_\_\_\_\_

\_\_\_\_\_ ; that he/she is \_\_\_\_\_ partner of \_\_\_\_\_, a limited/general partnership existing under the laws of the State of \_\_\_\_\_, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

**ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL**

State of \_\_\_\_\_ County of \_\_\_\_\_ ss:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ before me personally came \_\_\_\_\_

to me known, who, being by me duly sworn did depose and say that he/she resides at \_\_\_\_\_

\_\_\_\_\_ and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

\_\_\_\_\_  
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

\*\*\*\*\*

Affix Acknowledgments and Justification of Sureties.

**ACKNOWLEDGEMENT OF ANNEXED INSTRUMENT**

**Acknowledgement by Surety**

**STATE OF NJ**

**COUNTY OF Morris**

On this 9<sup>th</sup> day of March , 2020 before me personally came Thomas J. Henn who, being by me duly sworn, did depose and say that he/she is an Attorney-In-Fact of Liberty Mutual Insurance Company and knows the corporate seal thereof; that the seal affixed to said instrument is such corporate seal, and was thereto affixed by authority of the Power of Attorney of said Company, of which a Certified Copy is hereto attached, and that he/she signed said instrument as an Attorney-In-Fact of said Company by like authority.

  
**NOTARY PUBLIC**

SUSAN BULMAN-DITCHKUS  
Notary Public  
State of New Jersey  
ID# 2406166  
My Commission Expires March 24, 2021



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

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

Certificate No: 8197164-974858

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Susan Bulman-Ditchkus; Thomas J. Henn; John P. Hyland; Daryl LaForge; Robert F. Laing

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

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 22nd day of October, 2018.



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

By: David M. Carey, Assistant Secretary

Not valid for mortgage, no plan, letter of credit, currency rate, interest rate, residual value guarantees.

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 22nd day of October, 2018 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

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



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella, Notary Public

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

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

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

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

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

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

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of March, 2020.



By: Renee C. Llewellyn, Assistant Secretary

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



LIBERTY MUTUAL INSURANCE COMPANY  
FINANCIAL STATEMENT — DECEMBER 31, 2018

<b>Assets</b>	<b>Liabilities</b>
Cash and Bank Deposits..... \$464,341,712	Unearned Premiums..... \$7,851,429,449
*Bonds — U.S Government..... 2,259,714,810	Reserve for Claims and Claims Expense..... 20,165,209,300
*Other Bonds..... 11,864,776,740	Funds Held Under Reinsurance Treaties..... 384,795,327
*Stocks..... 16,527,715,226	Reserve for Dividends to Policyholders..... 1,111,529
Real Estate..... 255,809,551	Additional Statutory Reserve..... 62,866,000
Agents' Balances or Uncollected Premiums..... 5,817,927,234	Reserve for Commissions, Taxes and
Accrued Interest and Rents..... 108,139,840	Other Liabilities..... 3,999,822,802
Other Admitted Assets..... 11,532,139,744	<b>Total..... \$32,465,234,407</b>
<b>Total Admitted Assets..... <u>\$48,830,564,857</u></b>	Special Surplus Funds..... \$43,108,583
	Capital Stock..... 10,000,000
	Paid in Surplus..... 10,044,912,727
	Unassigned Surplus..... 6,267,309,139
	<b>Surplus to Policyholders..... 16,365,330,449</b>
	<b>Total Liabilities and Surplus..... <u>\$48,830,564,856</u></b>



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

I, TIM MIKOLAJEWSKI, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the foregoing is a true, and correct statement of the Assets and Liabilities of said Corporation, as of December 31, 2018, to the best of my knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation at Seattle, Washington, this 22<sup>nd</sup> day of March, 2019.

*TAMikolajewski*

\_\_\_\_\_  
Assistant Secretary

**CERTIFICATE OF SOLVENCY UNDER SECTION 1111 OF THE NEW  
YORK INSURANCE LAW**

STATE OF NEW YORK

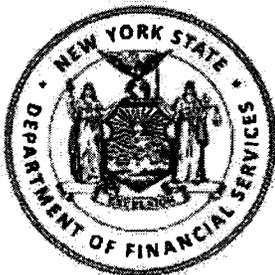
DEPARTMENT OF FINANCIAL SERVICES

It is hereby certified that

**Liberty Mutual Insurance Company  
Of Boston Massachusetts**

a corporation organized under the laws of the State of Massachusetts and duly authorized to transact the business of insurance in this State, is qualified to become surety or guarantor on all bonds, undertakings, recognizances, guaranties and other obligations required or permitted by law; and that the said corporation is possessed of a capital and surplus including gross paid-in and contributed surplus and unassigned funds (surplus) aggregating the sum of \$16,365,330,449 (Capital \$10,000,000) as is shown by its sworn financial statement for the last quarter ending December 31, 2018 on file in this Department, prior to audit.

The said corporation cannot lawfully expose itself to loss on any one risk or hazard to an amount exceeding 10% of its surplus to policyholders, unless it shall be protected in excess of that amount in the manner provided in Section 4118 of the Insurance Law of this State.



In Witness Whereof, I have  
unto set my hand and affixed  
official seal of this Department  
in the City of Albany, this  
19th day of March 2019.

Maria T. Vullo  
Superintendent

By 

**Ellen R Buxbaum  
Special Deputy Superintendent**

**Payment Bond (Pages 108 to 111): 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, \_\_\_\_\_

Delric Construction Co., Inc.  
845 Belmont Avenue  
North Haledon, NJ 07508

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

Liberty Mutual Insurance Company  
175 Berkeley Street  
Boston, MA 02116

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

Twenty Two Million Seven Hundred Ninety Six Thousand Seven Hundred Ninety three and no/100 dollars

(\$22,796,793.00) 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

DSNY District SI-3 Garage & Repair Shop-HVAC System and Roof Replacement-Borough of Staten Island  
FMS ID: S136-383S; E-PIN: 85019B0092001; DDC Pin: 8502019TR0002C

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so engaged who perform the work of laborers or mechanics at or in the vicinity of the site

**Payment Bond (Pages 108 to 111): Use for any contract for which a Payment Bond is required.**

**PAYMENT BOND (Page 2)**

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 place in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

**Payment Bond (Pages 108 to 111): Use for any contract for which a Payment Bond is required.**

**PAYMENT BOND (Page 3)**

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 9th day of March, 2020

Delric Construction Co., Inc.

(Seal)

(L.S.)

Principal

By:

Anthony Della Cerra, VP

(Seal)

Liberty Mutual Insurance Company

Surety

By:

Thomas J. Henn, 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 108 to 111): Use for any contract for which a Payment Bond is required.**

PAYMENT BOND (Page 4)

**ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION**

State of New Jersey County of Passaic ss:

On this 9th day of March, 2020, before me personally came Anthony Della Cerra to me known, who, being by me duly sworn did depose and say that he resides at 507 Squaw Brook Rd North Haledon, NJ that he is the Vice President of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

Marguerite Wemken  
Notary Public or Commissioner of Deeds

MARGUERITE WEMKEN  
NOTARY PUBLIC OF NEW JERSEY  
MY COMMISSION EXPIRES JULY 27, 2022  
MY COMMISSION EXPIRES JULY 27, 2022

**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.

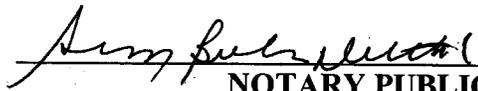
**ACKNOWLEDGEMENT OF ANNEXED INSTRUMENT**

**Acknowledgement by Surety**

**STATE OF NJ**

**COUNTY OF Morris**

On this 9<sup>th</sup> day of March , 2020 before me personally came Thomas J. Henn who, being by me duly sworn, did depose and say that he/she is an Attorney-In-Fact of Liberty Mutual Insurance Company and knows the corporate seal thereof; that the seal affixed to said instrument is such corporate seal, and was thereto affixed by authority of the Power of Attorney of said Company, of which a Certified Copy is hereto attached, and that he/she signed said instrument as an Attorney-In-Fact of said Company by like authority.

  
**NOTARY PUBLIC**

SUSAN BULMAN-DITCHKUS  
Notary Public  
State of New Jersey  
ID# 2406166  
My Commission Expires March 24, 2021



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

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

Certificate No: 8197164-974858

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Susan Bulman-Ditchkus; Thomas J. Henn; John P. Hyland; Daryl LaForge; Robert F. Laing

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

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 22nd day of October, 2018.



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

By: David M. Carey

David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 22nd day of October, 2018 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

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



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

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

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

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

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

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

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

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

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

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of March, 2020.



By: Renee C. Llewellyn

Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, no loan, letter of credit, currency rate, interest rate residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.



LIBERTY MUTUAL INSURANCE COMPANY  
 FINANCIAL STATEMENT — DECEMBER 31, 2018

Assets		Liabilities	
Cash and Bank Deposits .....	\$464,341,712	Unearned Premiums .....	\$7,851,429,449
*Bonds — U.S Government .....	2,259,714,810	Reserve for Claims and Claims Expense .....	20,165,209,300
*Other Bonds .....	11,864,776,740	Funds Held Under Reinsurance Treaties .....	384,795,327
*Stocks .....	16,527,715,226	Reserve for Dividends to Policyholders .....	1,111,529
Real Estate .....	255,809,551	Additional Statutory Reserve .....	62,866,000
Agents' Balances or Uncollected Premiums .....	5,817,927,234	Reserve for Commissions, Taxes and	
Accrued Interest and Rents .....	108,139,840	Other Liabilities .....	3,999,822,802
Other Admitted Assets .....	11,532,139,744	<b>Total .....</b>	<b>\$32,465,234,407</b>
<b>Total Admitted Assets .....</b>	<b><u>\$48,830,564,857</u></b>	Special Surplus Funds .....	\$43,108,583
		Capital Stock .....	10,000,000
		Paid in Surplus .....	10,044,912,727
		Unassigned Surplus .....	6,267,309,139
		Surplus to Policyholders .....	16,365,330,449
		<b>Total Liabilities and Surplus .....</b>	<b><u>\$48,830,564,856</u></b>



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

I, TIM MIKOLAJEWSKI, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the foregoing is a true, and correct statement of the Assets and Liabilities of said Corporation, as of December 31, 2018, to the best of my knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation at Seattle, Washington, this 22<sup>nd</sup> day of March, 2019.

*T. Mikolajewski*

Assistant Secretary

**CERTIFICATE OF SOLVENCY UNDER SECTION 1111 OF THE NEW YORK INSURANCE LAW**

STATE OF NEW YORK  
DEPARTMENT OF FINANCIAL SERVICES

It is hereby certified that

**Liberty Mutual Insurance Company**  
Of Boston Massachusetts

a corporation organized under the laws of the State of Massachusetts and duly authorized to transact the business of insurance in this State, is qualified to become surety or guarantor on all bonds, undertakings, recognizances, guaranties and other obligations required or permitted by law; and that the said corporation is possessed of a capital and surplus including gross paid-in and contributed surplus and unassigned funds (surplus) aggregating the sum of \$16,365,330,449 (Capital \$10,000,000) as is shown by its sworn financial statement for the last quarter ending December 31, 2018 on file in this Department, prior to audit.

The said corporation cannot lawfully expose itself to loss on any one risk or hazard to an amount exceeding 10% of its surplus to policyholders, unless it shall be protected in excess of that amount in the manner provided in Section 4118 of the Insurance Law of this State.



In Witness Whereof, I have  
unto set my hand and affixed  
official seal of this Department  
in the City of Albany, this

19th day of March 2019.

Maria T. Vullo  
Superintendent

By 

**Ellen R Buxbaum**  
Special Deputy Superintendent



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

5/12/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> Arthur J. Gallagher Risk Management Services, Inc. 200 Jefferson Park Whippany NJ 07981	<b>CONTACT NAME:</b> <b>PHONE (A/C. No. Ext):</b> 800-350-8005		<b>FAX (A/C. No):</b> 973-921-2876
	<b>E-MAIL ADDRESS:</b>		
<b>INSURER(S) AFFORDING COVERAGE</b>			<b>NAIC #</b>
<b>INSURED</b> Delric Construction Co., Inc. 845 Belmont Avenue North Haledon, NJ 75080306	<b>INSURER A :</b> Selective Fire & Casualty Insurance Company		14377
	<b>INSURER B :</b> Starr Indemnity & Liability Company		38318
	<b>INSURER C :</b> RSUI Indemnity Company		22314
	<b>INSURER D :</b> Great American Insurance Company		16691
	<b>INSURER E :</b> Charter Oak Fire Insurance Company		25615
<b>INSURER F :</b>			

**COVERAGES**

CERTIFICATE NUMBER: 779626765

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
E	<b>COMMERCIAL GENERAL LIABILITY</b> <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:	Y		VTO-CO-2793C167-COF-20	5/3/2020	5/3/2021	EACH OCCURRENCE	\$ 2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 300,000
							MED EXP (Any one person)	\$ 10,000
							PERSONAL & ADV INJURY	\$ 2,000,000
							GENERAL AGGREGATE	\$ 4,000,000
							PRODUCTS - COMP/OP AGG	\$ 4,000,000
								\$
A	<b>AUTOMOBILE LIABILITY</b> <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			S2019144	5/3/2020	5/3/2021	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
B C	<b>UMBRELLA LIAB</b> <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> <b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 0			1000585755201 NHA089944	5/3/2020 5/3/2020	5/3/2021 5/3/2021	EACH OCCURRENCE	\$ 8,000,000
							AGGREGATE	\$ 8,000,000
								\$
	<b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b> ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A				PER STATUTE	OTH-ER
							E.L. EACH ACCIDENT	\$
							E.L. DISEASE - EA EMPLOYEE	\$
							E.L. DISEASE - POLICY LIMIT	\$
D	Pollution/Professional			PCE184974609	5/3/2020	5/3/2021	Each Claim Aggregate	\$2,000,000 \$4,000,000

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

Note: NY WC Section issuing carrier is Phoenix Ins. Co. Travelers General Liability Blanket Additional Insured Endt: CGD246 (04/19); Selective Automobile Additional Insured Endt CA7809 11/17 & CA7816 11/17; Great American Pollution Blanket Additional Insured Endt: PCM6001 08/15  
 RE: Job location: DSNY District S13 Garage & Repair Shop, 1000 West Service Road, Staten Island, NY 10314.

City of New York, NYPL, including its officials and employees are named as additional insured's on the above General Liability policy, as required in written contract as per form CGD246 0419.

**CERTIFICATE HOLDER****CANCELLATION**

New York Department of Design  
 30-30 Thomson Ave  
 Long Island City NY 11101

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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ACORD 25 (2016/03)

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THIS CERTIFICATE SUPERSEDES PREVIOUSLY ISSUED CERTIFICATE



# NEW YORK CONSTRUCTION CERTIFICATE OF LIABILITY INSURANCE ADDENDUM

DATE (MM/DD/YYYY) 5/12/2020
--------------------------------

**THIS ADDENDUM SUMMARIZES SOME OF THE POLICY PROVISIONS IN THE REFERENCED INSURANCE POLICIES AND IS ISSUED AS A MATTER OF INFORMATION ONLY; IT CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. ALL TERMS, EXCLUSIONS AND CONDITIONS IN THE ACTUAL POLICY SHOULD BE CONSULTED FOR A MORE DETAILED ANALYSIS OF COVERAGE, AS THIS ADDENDUM DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES.**

AGENCY Arthur J. Gallagher Risk Management Services, Inc.	NAMED INSURED(S) Delric Construction Co., Inc.		
POLICY NUMBER	EFFECTIVE DATE	CARRIER	NAIC CODE

**ADDENDUM INFORMATION      CERTIFICATE NUMBER: 779626765      REVISION NUMBER:**

**A. Insurer**

- Admitted / authorized
- Excess line or free trade zone

**B. General Liability (GL) policy form**

- ISO / ISO modified
- Other

**C. Specific operations excluded or restricted (GL policy)**

- Location: \_\_\_\_\_
- Type of construction: \_\_\_\_\_
- Building height: Residential Exclusion
- Classifications [see attached declarations / endorsement]
- Designated work [see attached endorsement]

**D. Additional insured endorsement (GL policy)**

- CG 20 10     CG 20 26     CG 20 32     CG 20 33     CG 20 37     CG 20 38
- Other:    #: Trlvs#CGD246    Title: \_\_\_\_\_

**E. According to the terms of this GL policy, the additional insured has primary and noncontributory coverage**

- Yes     No and     no other option is available with this insurer

**F. Additional insured will receive advance notice if insurer cancels (GL policy)**

- Yes     No and     no other option is available with this insurer

**G. Blanket contractual liability located in the "insured contract" definition (Section V, Number 9, Item f. in the ISO CGL policy) is removed or restricted**

- Yes and     no other option is available with this insurer     No changes made

**H. "Insured contract" exception to the employers liability exclusion is removed or modified (GL policy)**

- Yes and     no other option is available with this insurer     No changes made

**I. GL policy (including endorsements) does not cover the additional insured for claims involving injury to employees of the named insured or subcontractors (not workers' compensation)**

- Yes and     no other option is available with this insurer     No changes made

**J. Earth movement, excavation or explosion / collapse / underground property damage is excluded or restricted (GL policy)**

Yes and  no other option is available with this insurer  No changes made

**K. Insured vs. insured suits (cross liability in the ISO CGL policy) are excluded or restricted (other than named insured vs. named insured)**

Yes and  no other option is available with this insurer  No changes made

**L. Property damage to work performed by subcontractors (exception to the "damage to your work" exclusion in the ISO CGL policy) is excluded or restricted**

Yes and  no other option is available with this insurer  No changes made

**M. Excess / umbrella policy is primary and non-contributory for additional insureds**

Yes, by specific policy provision  Yes, by endorsement  No and  no other option is available with this insurer



AUTHORIZED REPRESENTATIVE SIGNATURE

5/12/2020  
DATE (MM/DD/YYYY)



CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

Form with fields for: 1a. Legal Name & Address of Insured (Delric Construction Co., Inc.), 1b. Business Telephone Number (973-427-0058), 1c. NYS Unemployment Insurance Employer Registration Number (48365755), 1d. Federal Employer Identification Number (22-2111028), 2. Name and Address of Entity Requesting Proof of Coverage (New York Department of Design), 3a. Name of Insurance Carrier (Charter Oak Fire Insurance Company), 3b. Policy Number (UB-8P45754A), 3c. Policy effective period (05/03/2020 to 05/03/2021), 3d. The Proprietor, Partners or Executive Officers are included.

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. (To use this form, New York (NY) must be listed under Item 3A on the INFORMATION PAGE of the workers' compensation insurance policy).

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate.

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

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

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

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: Barbara J. Hancock (Print name of authorized representative or licensed agent of insurance carrier)
Approved by: [Signature] (Signature) 5/12/20 (Date)

Title: Area Assistant Vice President

Telephone Number of authorized representative or licensed agent of insurance carrier: 973-921-8227

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

## **Workers' Compensation Law**

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

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

# CERTIFICATE OF INSURANCE COVERAGE DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

**PART 1. To be completed by Disability and Paid Family Leave Benefits Carrier or Licensed Insurance Agent of that Carrier**

<p>1a. Legal Name &amp; Address of Insured (use street address only) <b>DELRIC CONSTRUCTION CO INC (VARIOUS NY LOCATIONS)</b></p> <p><b>845 BELMONT AVENUE NORTH HALEDON, NJ 07508</b></p> <p><small>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)</small></p>	<p>1b. Business Telephone Number of Insured <b>973-427-0058</b></p> <p>1c. Federal Employer Identification Number of Insured or Social Security Number <b>222111028</b></p>
<p>2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) <b>New York Department of Design</b></p> <p><b>30-30 Thomson Avenue Long Island City, NY 11101</b></p>	<p>3a. Name of Insurance Carrier <b>ShelterPoint Life Insurance Company</b></p> <p>3b. Policy Number of Entity Listed in Box "1a" <b>DBL573808</b></p> <p>3c. Policy effective period <u>01/01/2021</u> to <u>12/31/2021</u></p>

4. Policy provides the following benefits:

A. Both disability and paid family leave benefits.  
 B. Disability benefits only.  
 C. Paid family leave benefits only.

5. Policy covers:

A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law.  
 B. Only the following class or classes of employer's employees:

\_\_\_\_\_

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 2/3/2021 By   
(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number 516-829-8100 Name and Title Richard White, Chief Executive Officer

**IMPORTANT:** If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

**PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4C or 5B of Part 1 has been checked)**

**State of New York  
Workers' Compensation Board**

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability and Paid Family Leave Benefits Law with respect to all of his/her employees.

Date Signed \_\_\_\_\_ By \_\_\_\_\_  
(Signature of Authorized NYS Workers' Compensation Board Employee)

Telephone Number \_\_\_\_\_ Name and Title \_\_\_\_\_

**Please Note:** Only insurance carriers licensed to write NYS disability and paid family leave benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. **Insurance brokers are NOT authorized to issue this form.**



**SCHEDULE A (FOR PUBLICLY BID PROJECTS)**

**Relating to Article 22 - Insurance**

**PART III. Certification by Insurance Broker or Agent**

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

Barbara J. Hancock

[Name of broker or agent (typewritten)]

200 Jefferson Park, Whippany, NJ 07981

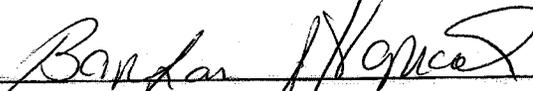
[Address of broker or agent (typewritten)]

barbara\_hancock@ajg.com

[Email address of broker or agent (typewritten)]

973-921-8227 phone #/973-921-2876 fax #

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



[Signature of authorized official or broker or agent]

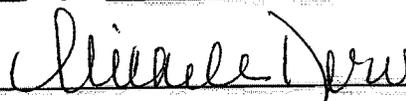
Barbara J. Hancock, Area Assistant V.P.

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

State of New Jersey )  
County of Essex ) ss:

Sworn to before me this

9th day of March, 2020

  
NOTARY PUBLIC FOR THE STATE OF New Jersey

MICHELE DERY  
NOTARY PUBLIC OF NEW JERSEY  
My Commission Expires 6/12/21

(NO TEXT ON THIS PAGE)

**OFFICE OF THE COMPTROLLER**

**CITY OF NEW YORK**

**CONSTRUCTION APPRENTICE  
PREVAILING WAGE SCHEDULE**

Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be paid at the apprentice rates in this schedule. Apprentices who are not so registered must be paid as journey persons in accordance with the trade classification of the work they actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

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

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

## **BOILERMAKER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Boilermaker (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$31.76

### **Boilermaker (Second Year: 1st Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$33.59

### **Boilermaker (Second Year: 2nd Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$35.43

### **Boilermaker (Third Year: 1st Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$37.25

### **Boilermaker (Third Year: 2nd Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 85% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$39.08

### **Boilermaker (Fourth Year: 1st Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$40.93

### **Boilermaker (Fourth Year: 2nd Six Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 95% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$42.75

(Local #5)

## **BRICKLAYER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

### **Bricklayer (First 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

### **Bricklayer (Second 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

### **Bricklayer (Third 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

### **Bricklayer (Fourth 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

### **Bricklayer (Fifth 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

### **Bricklayer (Sixth 750 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 95% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.61

(Bricklayer District Council)

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

**CARPENTER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

**Carpenter (First Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 40% of Journeyperson's rate

Supplemental Benefit Rate Per Hour For Building Apprentice: \$31.44

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$33.49

**Carpenter (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour For Building Apprentice: \$31.44

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$33.49

**Carpenter (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Benefit Rate Per Hour For Building Apprentice: \$31.44

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$33.49

**Carpenter (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour For Building Apprentice: \$31.44

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$33.49

(Carpenters District Council)

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**CARPENTER - HIGH RISE CONCRETE FORMS**

(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

**Carpenter - High Rise (First Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$17.52

Supplemental Benefit Rate per Hour: \$16.30

**Carpenter - High Rise (Second Year)**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$23.95  
Supplemental Benefit Rate per Hour: \$16.43

**Carpenter - High Rise (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$30.53  
Supplemental Benefit Rate per Hour: \$16.56

**Carpenter - High Rise (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$38.15  
Supplemental Benefit Rate per Hour: \$16.71

(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: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

**Cement Mason (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

**Cement Mason (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
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 Journeyman: 1 to 1, 1 to 3)

### **Cement & Concrete Worker (First 1333 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.00

### **Cement & Concrete Worker (Second 1333 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$25.45

### **Cement & Concrete Worker (Last 1334 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$26.95

### **Cement & Concrete Worker (Hired after 2/6/2016 - First 1334 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 53% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$14.04

### **Cement & Concrete Worker (Hired after 2/6/2016 - Second 1334 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 69% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$18.97

### **Cement & Concrete Worker (Hired after 2/6/2016 - Last 1334 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 85% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.05

(Cement Concrete Workers District Council)

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## **DERRICKPERSON & RIGGER (STONE)**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

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

**Derrickperson & Rigger (stone) - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: 50% of Journeyperson's rate

**Derrickperson & Rigger (stone) - Second Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

**Derrickperson & Rigger (stone) - Second Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

**Derrickperson & Rigger (stone) - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 90% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

(Local #197)

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**DOCKBUILDER/PILE DRIVER**  
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

**Dockbuilder/Pile Driver (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 40% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$34.12

**Dockbuilder/Pile Driver (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$34.12

**Dockbuilder/Pile Driver (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$34.12

**Dockbuilder/Pile Driver (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$34.12

(Carpenters District Council)

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**ELECTRICIAN**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Electrician (First Term: 0-6 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$15.75  
Supplemental Benefit Rate per Hour: \$14.03  
Overtime Supplemental Rate Per Hour: \$15.07

**Electrician (First Term: 7-12 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$16.25  
Supplemental Benefit Rate per Hour: \$14.28  
Overtime Supplemental Rate Per Hour: \$15.36

**Electrician (Second Term: 0-6 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$17.25  
Supplemental Benefit Rate per Hour: \$14.79  
Overtime Supplemental Rate Per Hour: \$15.94

**Electrician (Second Term: 7-12 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$18.25  
Supplemental Benefit Rate per Hour: \$15.30  
Overtime Supplemental Rate Per Hour: \$16.51

**Electrician (Third Term: 0-6 Months)**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$19.25  
Supplemental Benefit Rate per Hour: \$15.81  
Overtime Supplemental Rate Per Hour: \$17.09

**Electrician (Third Term: 7-12 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$20.25  
Supplemental Benefit Rate per Hour: \$16.32  
Overtime Supplemental Rate Per Hour: \$17.67

**Electrician (Fourth Term: 0-6 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$21.25  
Supplemental Benefit Rate per Hour: \$16.83  
Overtime Supplemental Rate Per Hour: \$18.24

**Electrician (Fourth Term: 7-12 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$23.25  
Supplemental Benefit Rate per Hour: \$17.85  
Overtime Supplemental Rate Per Hour: \$19.39

**Electrician (Fifth Term: 0-12 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$24.50  
Supplemental Benefit Rate per Hour: \$21.07  
Overtime Supplemental Rate Per Hour: \$22.62

**Electrician (Fifth Term: 13-18 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$29.00  
Supplemental Benefit Rate per Hour: \$23.43  
Overtime Supplemental Rate Per Hour: \$25.26

**Overtime Description**

Overtime Wage paid at time and one half the regular rate

(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: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$31.52

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$32.14

### **Elevator (Constructor) - Second Year**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$32.03

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$32.67

### **Elevator (Constructor) - Third Year**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Rate Per Hour: \$33.06

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Rate Per Hour: \$33.74

### **Elevator (Constructor) - Fourth Year**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$34.08

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$34.80

(Local #1)

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## **ELEVATOR REPAIR & MAINTENANCE**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

### **Elevator Service/Modernization Mechanic (First Year)**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Per Hour: \$31.47

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Per Hour: \$32.09

### **Elevator Service/Modernization Mechanic (Second Year)**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Benefit Per Hour: \$31.98

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Benefit Per Hour: \$32.62

### **Elevator Service/Modernization Mechanic (Third Year)**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Benefit Per Hour: \$32.99

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Benefit Per Hour: \$33.67

### **Elevator Service/Modernization Mechanic (Fourth Year)**

Effective Period: 7/1/2019 - 3/16/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Benefit Per Hour: \$34.01

Effective Period: 3/17/2020 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Benefit Per Hour: \$34.73

(Local #1)

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

**ENGINEER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 5)

**Engineer - First Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$25.38

Supplemental Benefit Rate per Hour: \$26.69

**Engineer - Second Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$31.72

Supplemental Benefit Rate per Hour: \$26.69

**Engineer - Third Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$34.89

Supplemental Benefit Rate per Hour: \$26.69

**Engineer - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$38.06

Supplemental Benefit Rate per Hour: \$26.69

(Local #15)

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**ENGINEER - OPERATING**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 5)

**Operating Engineer - First Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour 40% of Journeyman's Rate

Supplemental Benefit Per Hour: \$22.45

**Operating Engineer - Second Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 50% of Journeyman's Rate

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

Supplemental Benefit Per Hour: \$22.45

**Operating Engineer - Third Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 60% of Journeyman's Rate

Supplemental Benefit Per Hour: \$22.45

(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: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$31.24

**Floor Coverer (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$31.24

**Floor Coverer (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 65% of Journeyman's rate

Supplemental Rate Per Hour: \$31.24

**Floor Coverer (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Rate Per Hour: \$31.24

(Carpenters District Council)

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

## **GLAZIER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

### **Glazier (First Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

### **Glazier (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

### **Glazier (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

### **Glazier (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #1281)

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## **HAZARDOUS MATERIAL HANDLER**

(Ratio of Apprentice Journeyman: 1 to 1, 1 to 3)

### **Handler (First 1000 Hours)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 78% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$14.25

### **Handler (Second 1000 Hours)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$14.25

### **Handler (Third 1000 Hours)**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate Per Hour: 83% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$14.25

**Handler (Fourth 1000 Hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 89% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$14.25

(Local #78)

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**HEAT & FROST INSULATOR**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Heat & Frost Insulator (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 35% of Journeyman's rate

**Heat & Frost Insulator (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 45% of Journeyman's rate

**Heat & Frost Insulator (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 55% of Journeyman's rate

**Heat & Frost Insulator (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 65% 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)

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

**House Wrecker - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$21.17  
Supplemental Benefit Rate per Hour: \$19.09

**House Wrecker - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$22.32  
Supplemental Benefit Rate per Hour: \$19.09

**House Wrecker - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$23.97  
Supplemental Benefit Rate per Hour: \$19.09

**House Wrecker - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$26.53  
Supplemental Benefit Rate per Hour: \$19.09

(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: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$40.20

**Iron Worker (Ornamental) - 11 -16 Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$41.44

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

**Iron Worker (Ornamental) - 17 - 22 Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyperson's rate  
Supplemental Rate Per Hour: \$42.68

**Iron Worker (Ornamental) - 23 - 28 Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Rate Per Hour: \$45.17

**Iron Worker (Ornamental) - 29 - 36 Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Rate Per Hour: \$47.65

(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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$26.62  
Supplemental Benefit Rate per Hour: \$53.09

**Iron Worker (Structural) - 7- 18 Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$27.22  
Supplemental Benefit Rate per Hour: \$53.09

**Iron Worker (Structural) - 19 - 36 months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$27.83  
Supplemental Benefit Rate per Hour: \$53.09

(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: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$44.48

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Second 1000 hours**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$44.48

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Third 1000 hours**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$44.48

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Fourth 1000 hours**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 90% of Journeyman's rate  
Supplemental Rate Per Hour: \$44.48

(Local #731)

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**MARBLE MECHANICS**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Cutters & Setters - First 750 Hours**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

**Cutters & Setters - Second 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 45% of Journeyperson's rate

**Cutters & Setters - Third 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

**Cutters & Setters - Fourth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

**Cutters & Setters - Fifth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

**Cutters & Setters - Sixth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

**Cutters & Setters - Seventh 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

**Cutters & Setters - Eighth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

**Cutters & Setters - Ninth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

**Cutters & Setters - Tenth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

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

**Polishers & Finishers - First 900 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 70% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

**Polishers & Finishers - Second 900 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

**Polishers & Finishers - Third 900 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 90% of Journeyman's rate

(Local #7)

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**MASON TENDER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Mason Tender - First Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$21.39

Supplemental Benefit Rate per Hour: \$19.90

**Mason Tender - Second Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$22.54

Supplemental Benefit Rate per Hour: \$19.90

**Mason Tender - Third Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$24.29

Supplemental Benefit Rate per Hour: \$19.90

**Mason Tender - Fourth Year**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$26.95**  
Supplemental Benefit Rate per Hour: **\$19.90**

(Local #79)

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**METALLIC LATHER**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Metallic Lather (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$23.04**  
Supplemental Benefit Rate per Hour: **\$20.00**

**Metallic Lather (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$28.38**  
Supplemental Benefit Rate per Hour: **\$20.66**

**Metallic Lather (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$34.68**  
Supplemental Benefit Rate per Hour: **\$21.32**

**Metallic Lather (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$37.18**  
Supplemental Benefit Rate per Hour: **\$21.82**

(Local #46)

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**MILLWRIGHT**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

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

**Millwright (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$29.16**  
Supplemental Benefit Rate per Hour: **\$34.66**

**Millwright (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$34.46**  
Supplemental Benefit Rate per Hour: **\$38.31**

**Millwright (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$39.76**  
Supplemental Benefit Rate per Hour: **\$42.61**

**Millwright (Fourth Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$50.36**  
Supplemental Benefit Rate per Hour: **\$49.27**

(Local #740)

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**PAINTER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Painter - Brush & Roller - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$17.20**  
Supplemental Benefit Rate per Hour: **\$15.05**

**Painter - Brush & Roller - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$21.50**  
Supplemental Benefit Rate per Hour: **\$19.39**

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

**Painter - Brush & Roller - Third Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$25.80

Supplemental Benefit Rate per Hour: \$22.79

**Painter - Brush & Roller - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$34.40

Supplemental Benefit Rate per Hour: \$29.16

(District Council of Painters)

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**PAINTER - METAL POLISHER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Metal Polisher (First Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$13.00

Supplemental Benefit Rate per Hour: \$5.13

**Metal Polisher (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$13.00

Supplemental Benefit Rate per Hour: \$5.13

**Metal Polisher (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$15.75

Supplemental Benefit Rate per Hour: \$5.13

(Local 8A-28)

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

**PAINTER - STRUCTURAL STEEL**  
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Painters - Structural Steel (First Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

**Painters - Structural Steel (Second Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

**Painters - Structural Steel (Third Year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #806)

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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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$28.86  
Supplemental Benefit Rate per Hour: \$21.40

**Paver and Roadbuilder - Second Year (Minimum 1000 hours)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$30.50  
Supplemental Benefit Rate per Hour: \$21.40

(Local #1010)

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

**PLASTERER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Plasterer - First Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 40% of Journeyman's rate  
Supplemental Rate Per Hour: \$13.88

**Plasterer - First Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 45% of Journeyman's rate  
Supplemental Rate Per Hour: \$14.36

**Plasterer - Second Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$16.44

**Plasterer - Second Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$17.53

**Plasterer - Third Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Rate Per Hour: \$19.72

**Plasterer - Third Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$20.81

(Local #530)

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**PLASTERER - TENDER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

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

**Plasterer Tender - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$21.39  
Supplemental Benefit Rate per Hour: \$19.90

**Plasterer Tender - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$22.54  
Supplemental Benefit Rate per Hour: \$19.90

**Plasterer Tender - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$24.29  
Supplemental Benefit Rate per Hour: \$19.90

**Plasterer Tender - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$26.95  
Supplemental Benefit Rate per Hour: \$19.90

(Local #79)

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**PLUMBER**

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

**Plumber - First Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$16.28  
Supplemental Benefit Rate per Hour: \$5.43

**Plumber - First Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$19.28  
Supplemental Benefit Rate per Hour: \$6.43

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

**Plumber - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$27.23  
Supplemental Benefit Rate per Hour: \$19.80

**Plumber - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$29.33  
Supplemental Benefit Rate per Hour: \$19.80

**Plumber - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$32.18  
Supplemental Benefit Rate per Hour: \$19.80

**Plumber - Fifth Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$33.58  
Supplemental Benefit Rate per Hour: \$19.80

**Plumber - Fifth Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$45.65  
Supplemental Benefit Rate per Hour: \$19.80

(Plumbers Local #1)

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**POINTER, WATERPROOFER, CAULKER, SANDBLASTER,  
STEAMBLASTER**

(Exterior Building Renovation)

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

**Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$26.36  
Supplemental Benefit Rate per Hour: \$14.00

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

**Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$29.42  
Supplemental Benefit Rate per Hour: \$18.97

**Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$34.80  
Supplemental Benefit Rate per Hour: \$21.72

**Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$41.93  
Supplemental Benefit Rate per Hour: \$22.72

(Bricklayer District Council)

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**ROOFER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 2)

**Roofers - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 35% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$3.36

**Roofers - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$16.92

**Roofers - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Benefit Rate Per Hour: \$20.29

**Roofers - Fourth Year**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyperson's rate  
Supplemental Benefit Rate Per Hour: \$25.37

(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: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 25% of Journeyperson's rate  
Supplemental Rate Per Hour: \$6.51

**Sheet Metal Worker (7-18 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 35% of Journeyperson's rate  
Supplemental Rate Per Hour: \$18.57

**Sheet Metal Worker (19-30 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 45% of Journeyperson's rate  
Supplemental Rate Per Hour: \$25.40

**Sheet Metal Worker (31-36 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$29.95

**Sheet Metal Worker (37-42 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 55% of Journeyperson's rate  
Supplemental Rate Per Hour: \$29.95

**Sheet Metal Worker (43-48 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyperson's rate  
Supplemental Rate Per Hour: \$36.83

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

**Sheet Metal Worker (49-54 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Rate Per Hour: \$36.83

**Sheet Metal Worker (55-60 Months)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$41.42

(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: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 35% of Journeyman's rate  
Supplemental Rate Per Hour: \$15.75

**Sign Erector - First Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 40% of Journeyman's rate  
Supplemental Rate Per Hour: \$17.86

**Sign Erector - Second Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 45% of Journeyman's rate  
Supplemental Rate Per Hour: \$19.98

**Sign Erector - Second Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 50% of Journeyman's rate  
Supplemental Rate Per Hour: \$22.12

**Sign Erector - Third Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate Per Hour: 55% of Journeyman's rate  
Supplemental Rate Per Hour: \$29.92

**Sign Erector - Third Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 60% of Journeyman's rate  
Supplemental Rate Per Hour: \$32.56

**Sign Erector - Fourth Year: 1st Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyman's rate  
Supplemental Rate Per Hour: \$35.92

**Sign Erector - Fourth Year: 2nd Six Months**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 70% of Journeyman's rate  
Supplemental Rate Per Hour: \$38.65

**Sign Erector - Fifth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 75% of Journeyman's rate  
Supplemental Rate Per Hour: \$41.33

**Sign Erector - Sixth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyman's rate  
Supplemental Rate Per Hour: \$44.01

(Local #137)

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**STEAMFITTER**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

**Steamfitter - First Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate and Supplemental Per Hour: 40% of Journeyman's rate

**Steamfitter - Second Year**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate and Supplemental Rate Per Hour: 50% of Journeyman's rate.

**Steamfitter - Third Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate and Supplemental Rate per Hour: 65% of Journeyman's rate.

**Steamfitter - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate and Supplemental Rate Per Hour: 80% of Journeyman's rate.

**Steamfitter - Fifth Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate and Supplemental Rate Per Hour: 85% of Journeyman's rate.

(Local #638)

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**STONE MASON - SETTER**

(Ratio Apprentice of Journeyman: 1 to 1, 1 to 2)

**Stone Mason - Setters - First 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

**Stone Mason - Setters - Second 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 60% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

**Stone Mason - Setters - Third 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 70% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

**Stone Mason - Setters - Fourth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

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

**Stone Mason - Setters - Fifth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020  
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: 7/1/2019 - 6/30/2020  
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: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

**Drywall Taper - Second Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

**Drywall Taper - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
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)

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

**Tile Layer - Setter - First 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

**Tile Layer - Setter - Second 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 55% of Journeyman's rate

**Tile Layer - Setter - Third 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 65% of Journeyman's rate

**Tile Layer - Setter - Fourth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 75% of Journeyman's rate

**Tile Layer - Setter - Fifth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 85% of Journeyman's rate

**Tile Layer - Setter - Sixth 750 Hours**

Effective Period: 7/1/2019 - 6/30/2020

Wage and Supplemental Rate Per Hour: 95% of Journeyman's rate

(Local #7)

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**TIMBERPERSON**

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 6)

**Timberperson - First Year**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate Per Hour: 40% of Journeyman's rate

Supplemental Rate Per Hour: \$33.76

**Timberperson - Second Year**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate Per Hour: 50% of Journeyperson's rate  
Supplemental Rate Per Hour: \$33.76

**Timberperson - Third Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 65% of Journeyperson's rate  
Supplemental Rate Per Hour: \$33.76

**Timberperson - Fourth Year**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate Per Hour: 80% of Journeyperson's rate  
Supplemental Rate Per Hour: \$33.76

(Local #1536)

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

LABOR LAW ARTICLE 8 - NYC PUBLIC WORKS

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to Labor Law Article 8 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work projects. Prevailing rates are required to be annexed to and form part of the public work contract pursuant to § 220 (3).

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to 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 work contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public work contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public work contracts in the procurement stage must contact the contracting agency responsible for the procurement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public work contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-4443. All callers must have the agency name and contract registration number available when calling with questions on public work contracts. Please direct all other compliance issues to: Bureau of Labor Law, Attn: Wasyl Kinach, P.E., Office of the Comptroller, 1 Centre Street, Room 651, 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 [comptroller.nyc.gov/wages](http://comptroller.nyc.gov/wages). Contractors must pay the wages and supplements in effect when the worker, laborer, mechanic performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site [comptroller.nyc.gov/wages](http://comptroller.nyc.gov/wages).

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  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Prevailing rates and ratios for apprentices are published in the Construction Apprentice Prevailing Wage Schedule. Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the New York State Department of Labor, may be paid at the apprentice rates. Apprentices who are not so registered must be paid as journey persons.

New York City public work projects awarded pursuant to a Project Labor Agreement (“PLA”) in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA’s pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor’s Office of Contract Services (MOCS) web page at:

<https://www1.nyc.gov/site/mocs/legal-forms/project-labor-agreements.page>

All the provisions of Labor Law Article 8 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller in accordance with the trade classifications in this schedule; however, we will enforce shift, premium, overtime and other non-standard rates as they appear in a project’s pre-negotiated labor agreement.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

- 1) Provide bona fide fringe benefits which cost the employer no less than the prevailing supplemental benefits rate; or
- 2) Supplement the employee’s hourly wage by an amount no less than the prevailing supplemental benefits rate; or
- 3) Provide a combination of bona fide fringe benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.

Although prevailing wage laws do not require employers to provide bona fide fringe benefits (as opposed to wage supplements) to their employees, other laws may. For example, the Employee Retirement Income Security Act, 29 U.S.C. § 1001 et seq., the Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq., and the New York City Paid Sick Leave Law, N.Y.C. Admin. Code § 20-911 et seq., require certain employers to provide certain benefits to their employees. Labor agreements to which employers are a party may also require certain benefits. The Comptroller’s Office does not enforce these laws or agreements.

Employers must provide prevailing supplemental benefits at the straight time rate for each hour worked unless otherwise noted in the classification.

Paid Holidays, Vacation and Sick Leave when listed must be paid or provided in addition to the prevailing hourly supplemental benefit rate.

For more information, please refer to the Comptroller’s Prevailing Wage Law Regulations in Title 44 of the Rules of the City of New York, Chapter 2, available at [comptroller.nyc.gov/wages](http://comptroller.nyc.gov/wages).

**Wasył Kinach, P.E.**  
Director of Classifications  
Bureau of Labor Law

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

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**ASBESTOS HANDLER**  
**SEE HAZARDOUS MATERIAL HANDLER**

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**BLASTER**

**Blaster**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$55.86**  
Supplemental Benefit Rate per Hour: **\$44.48**

**Blaster- Hydraulic Trac Drill**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$50.00**  
Supplemental Benefit Rate per Hour: **\$44.48**

**Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$49.17**  
Supplemental Benefit Rate per Hour: **\$44.48**

**Blaster - Journeyperson**

(Laborer, Chipper/Jackhammer including Walk Behind Self Propelled Hydraulic Asphalt and Concrete Breakers and Hydro (Water) Demolition, Powder Carrier, Hydraulic Chuck Tender, Chuck Tender and Nipper)

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$42.65**  
Supplemental Benefit Rate per Hour: **\$44.48**

**Blaster - Magazine Keepers: (Watch Person)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$21.33**  
Supplemental Benefit Rate per Hour: **\$44.48**

**Overtime**

Time and one half the regular rate after an 8 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.

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

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Thanksgiving Day  
Christmas Day

**Paid Holidays**

Labor Day  
Thanksgiving Day

**Shift Rates**

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

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**BOILERMAKER**

**Boilermaker**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$59.17

Supplemental Benefit Rate per Hour: \$44.59

Supplemental Note: For time and one half overtime - \$66.44 For double overtime - \$88.28

**Overtime Description**

For Repair and Maintenance work:

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

For New Construction work:

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day

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

Columbus Day  
Election Day  
Veteran's Day  
Thanksgiving Day  
Christmas Day

Quadruple time the regular rate for work on the following holiday(s).  
Labor Day

### **Paid Holidays**

Good Friday  
Day after Thanksgiving  
Day before Christmas  
Day before New Year's Day

### **Shift Rates**

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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$56.32**  
Supplemental Benefit Rate per Hour: **\$33.11**

### **Overtime**

Time and one half the regular rate after a 7 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.  
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

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$52.50**

Supplemental Benefit Rate per Hour: **\$46.38**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

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

Columbus Day

Presidential Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

**Paid Holidays**

None

**Shift Rates**

The employer may work two (2) shifts with the first shift at the straight time wage rate starting at the established time between 7 a.m. and 9 a.m. The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight (8) hours pay for seven (7) hours of work, nine (9) hours pay for eight (8) hours of work.

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

When it is not possible to conduct alteration work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

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**CARPENTER - HEAVY CONSTRUCTION WORK**  
(Construction of Engineering Structures and Building Foundations)

**Heavy Construction Work**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$54.68**

Supplemental Benefit Rate per Hour: **\$51.73**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

**Paid Holidays**

None

**Shift Rates**

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate.

(Carpenters District Council)

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## **CARPENTER - HIGH RISE CONCRETE FORMS** (Excludes Engineering Structures and Building Foundations)

### **Carpenter High Rise A**

Effective Period: 7/1/2019 - 6/30/2020

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

Supplemental Benefit Rate per Hour: **\$43.44**

### **Carpenter High Rise B**

Carpenter High Rise B worker is excluded from high risk operations such as erection decking, perimeter debris netting, leading edge work, self-climbing form systems, and the installation of cocoon systems unless directly supervised by a Carpenter High Rise A worker.

Effective Period: 7/1/2019 - 6/30/2020

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

Supplemental Benefit Rate per Hour: **\$16.75**

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

### **Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Presidential Election Day

Thanksgiving Day

Christmas Day

### **Paid Holidays**

None

### **Shift Rates**

The second shift wage rate shall be 113% of the straight time hourly wage rate. There must be a first shift in order to work a second shift.

(Carpenters District Council)

## **CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST**

### **Carpenter - Hod Hoist**

(Assisted by Mason Tender)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.50**

Supplemental Benefit Rate per Hour: **\$39.56**

### **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.

(Carpenters District Council)

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## **CARPENTER - WOOD WATER STORAGE TANK**

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

**Tank Mechanic**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$34.14**  
Supplemental Benefit Rate per Hour: **\$19.00**

**Tank Helper**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$27.30**  
Supplemental Benefit Rate per Hour: **\$19.00**

**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.  
Time and one half the regular rate for work on a holiday plus the day's pay.

**Paid Holidays**

New Year's Day  
President's Day  
Good Friday  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Thanksgiving Day  
Day after Thanksgiving  
1/2 day on Christmas Eve if work is performed in the A.M.  
1/2 day on New Year's Eve if work is performed in the A.M.

**Vacation**

Employed for one (1) year.....one (1) week vacation (40 hours)  
Employed for three (3) years.....two (2) weeks vacation (80 hours)  
Employed for more than twenty (20) years.....three (3) weeks vacation (120 hours)

**SICK LEAVE:**

Two (2) sick days after being employed for twenty (20) years.

(Carpenters District Council)

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**CEMENT & CONCRETE WORKER**

**Cement & Concrete Worker**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$43.53**

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

Supplemental Benefit Rate per Hour: **\$28.95**

Supplemental Note: \$32.45 on Saturdays; \$35.95 on Sundays & Holidays

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$33.05**

Supplemental Benefit Rate per Hour: **\$20.95**

Supplemental Note: \$22.45 on Saturdays; \$23.95 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: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: **\$44.97**

Supplemental Benefit Rate per Hour: **\$40.56**

Supplemental Note: Supplemental benefit time and one half rate: \$71.19; Double time rate: double the base supplemental benefit rate.

### Overtime Description

Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on Sunday.

### 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) (BCA)

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## CORE DRILLER

### Core Driller

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$40.44**

Supplemental Benefit Rate per Hour: **\$26.70**

### Core Driller Helper

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$32.12**

Supplemental Benefit Rate per Hour: **\$26.70**

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

**Core Driller Helper(Third year in the industry)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$28.91**  
Supplemental Benefit Rate per Hour: **\$26.70**

**Core Driller Helper (Second year in the industry)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$25.70**  
Supplemental Benefit Rate per Hour: **\$26.70**

**Core Driller Helper (First year in the industry)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$22.48**  
Supplemental Benefit Rate per Hour: **\$26.70**

**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.

(Carpenters District Council)

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## **DERRICKPERSON AND RIGGER**

### **Derrick Person & Rigger**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.91**

Supplemental Benefit Rate per Hour: **\$54.11**

Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. \$55.53 - For work performed in Staten Island.

### **Derrick Person & Rigger - Site Work**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$42.59**

Supplemental Benefit Rate per Hour: **\$42.37**

### **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)**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$69.22**

Supplemental Benefit Rate per Hour: **\$51.73**

**Diver Tender (Marine)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$49.14**

Supplemental Benefit Rate per Hour: **\$51.73**

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$54.63**

Supplemental Benefit Rate per Hour: **\$51.73**

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

### Overtime

Time and one half the regular rate after an 8 hour day.

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$41.18**

Supplemental Benefit Rate per Hour: **\$49.65**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$22.08; at double time rate - \$29.44

### Driver - Tractor Trailer

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$43.84**

Supplemental Benefit Rate per Hour: **\$49.03**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$19.80; at double time rate - \$26.40

### Driver - Euclid & Turnapull Operator

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$44.40**

Supplemental Benefit Rate per Hour: **\$49.03**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$19.80; at double time rate - \$26.40

### 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 (8 1/2) hours allowing for one half hour for lunch and be paid 117.3% of the straight time hourly wage rate.

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### Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$39.00**

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

Supplemental Benefit Rate per Hour: \$45.52

Supplemental Note: Over 40 hours worked: time and one half rate \$16.78; double time rate \$22.37

### Overtime Description

For Paid Holidays: Employees working two (2) days in the calendar week in which the holiday falls are to be 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 installation of low voltage cabling carrying data, video and/or voice on building construction/alteration/renovation projects.)

### Electrician "A" (Regular Day / Day Shift)

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: \$56.00

Supplemental Benefit Rate per Hour: \$56.54

**Electrician "A" (Regular Day Overtime after 7 hrs / Day Shift Overtime after 8 hrs)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$84.00

Supplemental Benefit Rate per Hour: \$60.07

**Electrician "A" (Swing Shift)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$65.71

Supplemental Benefit Rate per Hour: \$64.36

**Electrician "A" (Swing Shift Overtime After 7.5 hours)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$98.57

Supplemental Benefit Rate per Hour: \$68.51

**Electrician "A" (Graveyard Shift)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$73.60

Supplemental Benefit Rate per Hour: \$70.94

**Electrician "A" (Graveyard Shift Overtime After 7 hours)**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$110.40

Supplemental Benefit Rate per Hour: \$75.59

**Overtime**

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

**Overtime Holidays**

Time and one half the regular rate for work on a holiday.

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

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

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 \$24.92.

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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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$29.00

Supplemental Benefit Rate per Hour: \$23.43

First and Second Year "M" Wage Rate Per Hour: \$24.50

First and Second Year "M" Supplemental Rate: \$21.07

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$43.50

Supplemental Benefit Rate per Hour: \$25.26

First and Second Year "M" Wage Rate Per Hour: \$36.75

First and Second Year "M" Supplemental Rate: \$22.62

**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

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

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: 7/1/2019 - 3/9/2020

Wage Rate per Hour: **\$33.40**

Supplemental Benefit Rate per Hour: **\$17.68**

Supplemental Note: \$16.06 only after 8 hours worked in a day

Effective Period: 3/10/2020 - 6/30/2020

Wage Rate per Hour: **\$33.90**

Supplemental Benefit Rate per Hour: **\$18.43**

Supplemental Note: \$16.80 only after 8 hours worked in a day

**Overtime Description**

Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.

Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

**Paid Holidays**

New Year's Day

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

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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$56.00  
Supplemental Benefit Rate per Hour: \$58.44

**Electrician - Electro Pole Foundation Installer**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$42.66  
Supplemental Benefit Rate per Hour: \$43.52

**Electrician - Electro Pole Maintainer**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$36.61  
Supplemental Benefit Rate per Hour: \$39.16

**Overtime Description**

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

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: 7/1/2019 - 3/16/2020

Wage Rate per Hour: **\$66.95**

Supplemental Benefit Rate per Hour: **\$36.65**

Effective Period: 3/17/2020 - 6/30/2020

Wage Rate per Hour: **\$69.56**

Supplemental Benefit Rate per Hour: **\$37.47**

### 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

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

Double time the regular rate for work on the following holiday(s).

**Paid Holidays**

New Year's Day  
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: 7/1/2019 - 3/16/2020

Wage Rate per Hour: **\$52.44**

Supplemental Benefit Rate per Hour: **\$36.55**

Effective Period: 3/17/2020 - 6/30/2020

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

Supplemental Benefit Rate per Hour: **\$37.37**

**Overtime Description**

For Scheduled Service Work: Double time - work scheduled in advance by two or more workers performed on Sundays, Holidays, and between midnight and 7:00am.

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on a holiday plus the day's pay.

**Paid Holidays**

New Year's Day  
President's Day

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$70.71

Supplemental Benefit Rate per Hour: \$39.74

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: \$113.14

### Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherry pickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar 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.

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$68.58  
Supplemental Benefit Rate per Hour: \$39.74  
Supplemental Note: \$72.08 on overtime  
Shift Wage Rate: \$109.73

**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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$65.00  
Supplemental Benefit Rate per Hour: \$39.74  
Supplemental Note: \$72.08 on overtime  
Shift Wage Rate: \$104.00

**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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$68.25  
Supplemental Benefit Rate per Hour: \$39.74  
Supplemental Note: \$72.08 on overtime  
Shift Wage Rate: \$109.20

**Engineer - Heavy Construction Maintenance Engineer II**

On Base Mounted Tower Cranes

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$90.00  
Supplemental Benefit Rate per Hour: \$39.74  
Supplemental Note: \$72.08 on overtime  
Shift Wage Rate: \$144.00

**Engineer - Heavy Construction Maintenance Engineer III**

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

On Generators, Light Towers

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$44.64**

Supplemental Benefit Rate per Hour: **\$39.74**

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: **\$71.42**

**Engineer - Heavy Construction Maintenance Engineer IV**

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$45.83**

Supplemental Benefit Rate per Hour: **\$39.74**

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: **\$73.33**

**Engineer - Steel Erection Maintenance Engineers**

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$65.31**

Supplemental Benefit Rate per Hour: **\$39.74**

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: **\$104.50**

**Engineer - Steel Erection Oiler I**

On a Truck Crane

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$61.05**

Supplemental Benefit Rate per Hour: **\$39.74**

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: **\$97.68**

**Engineer - Steel Erection Oiler II**

On a Crawler Crane

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$46.18**

Supplemental Benefit Rate per Hour: **\$39.74**

Supplemental Note: \$72.08 on overtime

Shift Wage Rate: **\$73.89**

**Overtime Description**

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

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

### **Overtime**

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

### **Paid Holidays**

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

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### **Engineer - Building Work Maintenance Engineers I**

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$62.45

Supplemental Benefit Rate per Hour: \$39.74

Supplemental Note: \$72.08 on overtime

### **Engineer - Building Work Maintenance Engineers II**

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$48.26

Supplemental Benefit Rate per Hour: \$39.74

Supplemental Note: \$72.08 on overtime

### **Engineer - Building Work Oilers I**

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$59.33

Supplemental Benefit Rate per Hour: \$39.74

Supplemental Note: \$72.08 on overtime

### Engineer - Building Work Oilers II

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$43.78

Supplemental Benefit Rate per Hour: \$39.74

Supplemental Note: \$72.08 on overtime

### **Overtime Description**

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

### **Overtime**

Double time the regular rate after an 8 hour day.

Double time the regular time rate for Saturday.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

### **Paid Holidays**

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

### **Shift Rates**

Off Shift: double time the regular hourly rate.

(Local #15)

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

## ENGINEER - CITY SURVEYOR AND CONSULTANT

### Party Chief

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$40.41

Supplemental Benefit Rate per Hour: \$22.75

Supplemental Note: Overtime Benefit Rate - \$27.25 per hour (time & one half) \$31.75 per hour (double time).

### Instrument Person

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$33.13

Supplemental Benefit Rate per Hour: \$22.75

Supplemental Note: Overtime Benefit Rate - \$27.25 per hour (time & one half) \$31.75 per hour (double time).

### Rodperson

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$28.54

Supplemental Benefit Rate per Hour: \$22.75

Supplemental Note: Overtime Benefit Rate - \$27.25 per hour (time & one half) \$31.75 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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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

**ENGINEER - FIELD (BUILDING CONSTRUCTION)**  
(Construction of Building Projects, Concrete Superstructures, etc.)

**Field Engineer - BC Party Chief**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$65.44**

Supplemental Benefit Rate per Hour: **\$35.12**

Supplemental Note: Overtime Benefit Rate - \$49.33 per hour (time & one half) \$63.54 per hour (double time).

**Field Engineer - BC Instrument Person**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.83**

Supplemental Benefit Rate per Hour: **\$35.12**

Supplemental Note: Overtime Benefit Rate - \$49.33 per hour (time & one half) \$63.54 per hour (double time).

**Field Engineer - BC Rodperson**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$32.84**

Supplemental Benefit Rate per Hour: **\$35.12**

Supplemental Note: Overtime Benefit Rate - \$49.33 per hour (time & one half) \$63.54 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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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

**ENGINEER - FIELD (HEAVY CONSTRUCTION)**

(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

**Field Engineer - HC Party Chief**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$74.18

Supplemental Benefit Rate per Hour: \$36.51

Supplemental Note: Overtime benefit rate - \$51.29 per hour (time & one half), \$66.07 per hour (double time).

**Field Engineer - HC Instrument Person**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$54.47

Supplemental Benefit Rate per Hour: \$36.51

Supplemental Note: Overtime benefit rate - \$51.29 per hour (time & one half), \$66.07 per hour (double time).

**Field Engineer - HC Rodperson**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$45.70

Supplemental Benefit Rate per Hour: \$36.51

Supplemental Note: Overtime benefit rate - \$51.29 per hour (time & one half), \$66.07 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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OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

## **ENGINEER - FIELD (STEEL ERECTION)**

### **Field Engineer - Steel Erection Party Chief**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$69.15**

Supplemental Benefit Rate per Hour: **\$36.01**

Supplemental Note: Overtime benefit rate - \$50.54 per hour (time & one half), \$65.07 per hour (double time).

### **Field Engineer - Steel Erection Instrument Person**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$53.88**

Supplemental Benefit Rate per Hour: **\$36.01**

Supplemental Note: Overtime benefit rate - \$50.54 per hour (time & one half), \$65.07 per hour (double time).

### **Field Engineer - Steel Erection Rodperson**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$36.04**

Supplemental Benefit Rate per Hour: **\$36.01**

Supplemental Note: Overtime benefit rate - \$50.54 per hour (time & one half), \$65.07 per hour (double time).

### **Overtime Description**

Time and one half the regular rate for Saturday for the first eight hours worked.

Double time the regular rate for Saturday for work performed in excess of eight hours.

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

### **Paid Holidays**

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Christmas Day

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

## **ENGINEER - OPERATING**

### **Operating Engineer - Road & Heavy Construction I**

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$81.17**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$129.87**

### **Operating Engineer - Road & Heavy Construction II**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$84.01**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$134.42**

### **Operating Engineer - Road & Heavy Construction III**

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$86.69**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$138.70**

### **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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$84.62**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$135.39**

### **Operating Engineer - Road & Heavy Construction V**

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

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$82.96**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: **\$59.95** overtime hours

Shift Wage Rate: **\$132.74**

**Operating Engineer - Road & Heavy Construction VI**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$78.85**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: **\$59.95** overtime hours

Shift Wage Rate: **\$126.16**

**Operating Engineer - Road & Heavy Construction VII**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$63.81**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: **\$59.95** overtime hours

Shift Wage Rate: **\$102.10**

**Operating Engineer - Road & Heavy Construction VIII**

Utility Compressors

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$49.67**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: **\$59.95** overtime hours

Shift Wage Rate: **\$62.44**

**Operating Engineer - Road & Heavy Construction IX**

Horizontal Boring Rig

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$75.02**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: **\$59.95** overtime hours

Shift Wage Rate: **\$120.03**

**Operating Engineer - Road & Heavy Construction X**

Elevators (manually operated as personnel hoist).

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$69.01**  
Supplemental Benefit Rate per Hour: **\$32.95**  
Supplemental Note: \$59.95 overtime hours  
Shift Wage Rate: **\$110.42**

**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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$53.74**  
Supplemental Benefit Rate per Hour: **\$32.95**  
Supplemental Note: \$59.95 overtime hours  
Shift Wage Rate: **\$85.98**

**Operating Engineer - Road & Heavy Construction XII**

All Drills and Machines of a similar nature.

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$79.68**  
Supplemental Benefit Rate per Hour: **\$32.95**  
Supplemental Note: \$59.95 overtime hours  
Shift Wage Rate: **\$127.49**

**Operating Engineer - Road & Heavy Construction XIII**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$77.19**  
Supplemental Benefit Rate per Hour: **\$32.95**  
Supplemental Note: \$59.95 overtime hours  
Shift Wage Rate: **\$123.50**

**Operating Engineer - Road & Heavy Construction XIV**

Concrete Mixer

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$73.82**  
Supplemental Benefit Rate per Hour: **\$32.95**  
Supplemental Note: \$59.95 overtime hours  
Shift Wage Rate: **\$118.11**

**Operating Engineer - Road & Heavy Construction XV**

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$49.99**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$79.98**

### 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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$70.53**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$112.85**

### Operating Engineer - Road & Heavy Construction XVII

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$71.06**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$113.70**

### Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$101.71**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$162.74**

### Operating Engineer - Paving I

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$78.85**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

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

Shift Wage Rate: \$126.16

**Operating Engineer - Paving II**

Asphalt Roller

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$76.83

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: \$122.93

**Operating Engineer - Paving III**

Asphalt Plants

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$65.08

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: \$104.13

**Operating Engineer - Concrete I**

Cranes

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$84.25

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Concrete II**

Compressors

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$50.37

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Concrete III**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$67.45

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

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

**Operating Engineer - Steel Erection I**

Three Drum Derricks

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$87.14**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$139.42**

**Operating Engineer - Steel Erection II**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$83.75**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$134.00**

**Operating Engineer - Steel Erection III**

Compressors, Welding Machines.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$49.95**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$79.92**

**Operating Engineer - Steel Erection IV**

Compressors - Not Combined with Welding Machine.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$47.58**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

Shift Wage Rate: **\$76.13**

**Operating Engineer - Building Work I**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$69.51**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

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

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$52.21

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Building Work III**

Double Drum

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$79.02

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Building Work IV**

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$83.68

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Building Work V**

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$77.15

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Building Work VI**

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$76.35

Supplemental Benefit Rate per Hour: \$32.95

Supplemental Note: \$59.95 overtime hours

**Operating Engineer - Building Work VII**

Rack & Pinion and House Cars

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$60.84**

Supplemental Benefit Rate per Hour: **\$32.95**

Supplemental Note: \$59.95 overtime hours

For New House Car projects Wage Rate per Hour \$48.70

### 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

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)

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

**Floor Coverer**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.50**

Supplemental Benefit Rate per Hour: **\$45.98**

**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

**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 a.m. to the end of the shift at straight time rate of pay. The wage rate for the second shift consisting of 7 hours shall be paid at 114.29% of straight time wage rate. The wage rate for the second shift consisting of 8 hours shall be paid 112.5% of the straight time wage rate. There must be a first shift to work the second shift.

(Carpenters District Council)

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**GLAZIER**

**(New Construction, Remodeling, and Alteration)**

**Glazier**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$46.05**

Supplemental Benefit Rate per Hour: **\$43.39**

Supplemental Note: Supplemental Benefit Overtime Rate: **\$65.10**

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

**Overtime**

Time and one half the regular rate after an 8 hour day.  
Time and one half the regular rate for Saturday.  
Time and one half the regular rate for Sunday.

**Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

**Paid Holidays**

None

**Shift Rates**

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

(Local #1281)

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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 \$141,750)

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$25.64

Supplemental Benefit Rate per Hour: \$22.29

**Overtime**

Time and one half the regular rate after an 8 hour day.  
Time and one half the regular rate for Sunday.  
Time and one half the regular rate for work on the following holiday(s).

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

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

Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Local #1281)

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**HAZARDOUS MATERIAL HANDLER**

(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

**Handler**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$36.50**

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.

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

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

(Local #78 and Local #12A)

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## HEAT AND FROST INSULATOR

### Heat & Frost Insulator

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$61.46**

Supplemental Benefit Rate per Hour: **\$40.46**

### 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.

(Local #12) (BCA)

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

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$37.18

Supplemental Benefit Rate per Hour: \$29.77

**House Wrecker - Tier B**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$26.41

Supplemental Benefit Rate per Hour: \$22.18

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

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**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: **\$45.15**

Supplemental Benefit Rate per Hour: **\$55.62**

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

### Overtime Description

Time and one half the regular rate after a 7 hour day for a maximum of two hours on any regular work day (the 8th and 9th hour) and double time shall be paid for all work on a regular work day thereafter, time and one half the regular rate for Saturday for the first seven hours of work and double time shall be paid for all work on a Saturday thereafter.

### Overtime

Double time the regular rate for Sunday.

### Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

### Paid Holidays

None

### Shift Rates

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$51.05**

Supplemental Benefit Rate per Hour: **\$76.89**

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

### Overtime Description

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

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  
President's Day  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

### Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.  
1/2 day on New Year's Eve if work is performed in the A.M.

### Shift Rates

Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

(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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$42.65

Supplemental Benefit Rate per Hour: \$44.48

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

### Overtime

Time and one half the regular rate after an 8 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.

### Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Thanksgiving Day  
Christmas Day

### Paid Holidays

Labor Day  
Thanksgiving Day

### Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

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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 (Year 6 and above)

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$31.75  
Supplemental Benefit Rate per Hour: \$16.05

### Landscaper (Year 3 - 5)

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$30.72  
Supplemental Benefit Rate per Hour: \$16.05

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

**Landscaper (up to 3 years)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$28.14  
Supplemental Benefit Rate per Hour: \$16.05

**Groundperson**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$28.14  
Supplemental Benefit Rate per Hour: \$16.05

**Tree Remover / Pruner**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$36.92  
Supplemental Benefit Rate per Hour: \$16.05

**Landscaper Sprayer (Pesticide Applicator)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$26.59  
Supplemental Benefit Rate per Hour: \$16.05

**Watering - Plant Maintainer**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$21.40  
Supplemental Benefit Rate per Hour: \$16.05

**Overtime Description**

For all overtime work performed, supplemental benefits shall include an additional seventy-five (\$0.75) cents per hour.

**Overtime**

Time and one half the regular rate after an 8 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.  
Time and one half the regular rate for work on a holiday plus the day's pay.

**Paid Holidays**

New Year's Day  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

**Shift Rates**

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$54.44**

Supplemental Benefit Rate per Hour: **\$40.77**

### Marble Finisher

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$42.86**

Supplemental Benefit Rate per Hour: **\$38.22**

### Marble Polisher

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$39.81**

Supplemental Benefit Rate per Hour: **\$30.35**

### Marble Maintenance Finisher

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$24.31**

Supplemental Benefit Rate per Hour: **\$13.34**

### **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.

### **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

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

Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Veteran's Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

**Paid Holidays**

None

(Local #7)

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**MASON TENDER**

**Mason Tender**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$38.40

Supplemental Benefit Rate per Hour: \$31.04

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

**Paid Holidays**

None

**Shift Rates**

The employer may work two (2) shifts with the first shift at the straight time wage rate and the second shift receiving eight (8) hours paid for seven (7) hours work at the straight time wage rate. When it is not possible to conduct alteration work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

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

(Local #79)

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## **MASON TENDER (INTERIOR DEMOLITION WORKER)**

### **Mason Tender Tier A**

Tier A Interior Demolition Worker performs all burning, chopping, and other technically skilled tasks related to interior demolition work.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$36.44**

Supplemental Benefit Rate per Hour: **\$24.50**

### **Mason Tender Tier B**

Tier B Interior Demolition Worker performs manual work and work incidental to demolition work, such as loading and carting of debris from the work site to an area where it can be loaded in to bins/trucks for removal. Also performs clean-up of the site when demolition is completed.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$25.63**

Supplemental Benefit Rate per Hour: **\$18.82**

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Sunday.

### **Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

### **Paid Holidays**

None

(Local #79)

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

## METALLIC LATHER

### Metallic Lather

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$46.23**

Supplemental Benefit Rate per Hour: **\$46.67**

Supplemental Note: Overtime Supplemental Benefit rate - \$57.92

### 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

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

Christmas Day

### Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

1/2 day on New Year's Eve if work is performed in the A.M.

### Shift Rates

There will be no shift differential paid on the first shift if more than one shift is employed. The shift differential will remain \$12/hour on the second and third shift for the first eight (8) hours if worked. There will be no pyramiding on overtime worked on second and third shifts. The time and one half (1.5x) rate will be against the base wage rate, not the shift differential

(Local #46)

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## MILLWRIGHT

### Millwright

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: **\$54.20**

Supplemental Benefit Rate per Hour: **\$53.81**

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$49.91**

Supplemental Benefit Rate per Hour: **\$43.24**

### **Mosaic Mechanic - Mosaic & Terrazzo Finisher**

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$48.31  
Supplemental Benefit Rate per Hour: \$43.24

**Mosaic Mechanic - Machine Operator Grinder**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$48.31  
Supplemental Benefit Rate per Hour: \$43.24

**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)

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**PAINTER**

**Painter - Brush & Roller**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$43.00  
Supplemental Benefit Rate per Hour: \$32.49  
Supplemental Note: \$ 37.75 on overtime

**Spray & Scaffold / Decorative / Sandblast**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$46.00

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

Supplemental Benefit Rate per Hour: **\$32.49**  
Supplemental Note: \$ 37.75 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 - LINE STRIPING (ROADWAY)

### Striping - Machine Operator

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$35.00**

Supplemental Benefit Rate per Hour: **\$12.37**

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02; New Hire Rate (0-3 months) - \$0.00

### Lineperson (Thermoplastic)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$39.00**

Supplemental Benefit Rate per Hour: **\$12.37**

Supplemental Note: Overtime Supplemental Benefit rate - \$8.02; New Hire Rate (0-3 months) - \$0.00

### Overtime Description

For Paid Holidays: Employees will only receive Holiday Pay for holidays not worked if said employee worked both the weekday before and the weekday after the holiday.

### Overtime

Time and one half the regular rate after an 8 hour day.

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

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

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**

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

Friday may be used as a make-up day.

### **Vacation**

Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation. Vacation must be taken during winter months.

(Local #1010)

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## **PAINTER - METAL POLISHER**

### **METAL POLISHER**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$30.58

Supplemental Benefit Rate per Hour: \$7.16

### **METAL POLISHER - NEW CONSTRUCTION**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$31.53

Supplemental Benefit Rate per Hour: \$7.16

### **METAL POLISHER - SCAFFOLD OVER 34 FEET**

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: \$34.08

Supplemental Benefit Rate per Hour: \$7.16

### Overtime Description

All work performed on Saturdays shall be paid at time-in-a half. The exception being; for suspended scaffold work and work deemed as a construction project; an eight (8) hour shift lost during the week due to circumstances beyond the control of the employer, up to a maximum of eight (8) hours per week, may be worked on Saturday at the straight time rate.

### Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Triple time the regular rate for work on the following holiday(s).

### Paid Holidays

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

### Shift Rates

Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

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## PAINTER - SIGN

### Sign Painter

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$41.98

Supplemental Benefit Rate per Hour: \$20.10

### Assistant Sign Painter

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: \$35.67

Supplemental Benefit Rate per Hour: \$18.47

**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
- President's Day
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day
- Election Day
- Thanksgiving Day
- Day after Thanksgiving
- Christmas Day

**Vacation**

- At least 1 year of employment.....1 week
- 2 years or more of employment.....2 weeks
- 8 years or more of employment.....3 weeks

(Local #8A-28A)

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**PAINTER - STRUCTURAL STEEL**

**Painters on Structural Steel**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$49.50

Supplemental Benefit Rate per Hour: \$41.83

**Painter - Power Tool**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$55.50

Supplemental Benefit Rate per Hour: \$41.83

Overtime Wage Rate: \$6.00 above the "Painters on Structural Steel" overtime rate.

**Overtime Description**

Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

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

### 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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$45.40**

Supplemental Benefit Rate per Hour: **\$34.74**

Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

### Overtime

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

### Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

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

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$46.85**

Supplemental Benefit Rate per Hour: **\$44.86**

Supplemental Note: For time and one half overtime - \$48.74 For double overtime - \$52.61

**Paver & Roadbuilder - Laborer**

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work for installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry/seal coating, paving stones, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$42.98**

Supplemental Benefit Rate per Hour: **\$44.86**

Supplemental Note: For time and one half overtime - \$48.74 For double overtime - \$52.61

**Production Paver & Roadbuilder - Screed Person**

(Production paving is asphalt paving when using a paving machine or on a project where a paving machine is traditionally used)

Adjustment of paving machinery on production paving jobs.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$47.45**

Supplemental Benefit Rate per Hour: **\$44.86**

Supplemental Note: For time and one half overtime - \$48.74 For double overtime - \$52.61

**Production Paver & Roadbuilder - Raker**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$46.85**

Supplemental Benefit Rate per Hour: **\$44.86**

Supplemental Note: For time and one half overtime - \$48.74 For double overtime - \$52.61

### **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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$42.98**

Supplemental Benefit Rate per Hour: **\$44.86**

Supplemental Note: For time and one half overtime - \$48.74 For double overtime - \$52.61

### **Overtime Description**

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

### **Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

Memorial Day

Independence Day

Labor Day

Columbus Day

Thanksgiving Day

### **Paid Holidays**

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

### **Shift Rates**

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours since only one half (1/2) hour is allowed for meal time.

When two or more shifts are employed, single time will be paid for each shift.

Night Work - On night work, the first eight (8) hours of work will be paid for at the single time rate, except that production paving work shall be paid at 10% over the single time rate for the screed person, rakers and shovelers directly involved only. This differential is to be paid when there is only one shift and the shift works at night. All other workers will be exempt. Hours worked over eight (8) hours during said shift shall be paid for at the time and one-half rate.

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

(Local #1010)

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## PLASTERER

### Plasterer

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$45.93

Supplemental Benefit Rate per Hour: \$26.52

### Overtime

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

### Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

### Paid Holidays

None

### Shift Rates

When it is not possible to conduct work during regular working hours (between 6:30am and 4:30pm), a shift differential shall be paid at the regular hourly rate plus a twelve per cent (12%) per hour differential. Workers on shift work shall be allowed a paid one-half hour meal break.

(Local #262)

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## PLASTERER - TENDER

### Plasterer - Tender

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$38.40**

Supplemental Benefit Rate per Hour: **\$31.04**

### **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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$69.00**

Supplemental Benefit Rate per Hour: **\$37.20**

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

### **Plumber - Temporary Services**

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$55.28

Supplemental Benefit Rate per Hour: \$29.68

### 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 (MECHANICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

### Plumber

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$43.05

Supplemental Benefit Rate per Hour: \$17.71

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

**Overtime**

Time and one half the regular rate after an 8 hour day.  
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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$47.89**

Supplemental Benefit Rate per Hour: **\$26.74**

**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

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

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$67.45**

Supplemental Benefit Rate per Hour: **\$25.26**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

**Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

**Paid Holidays**

None

**Shift Rates**

All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

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

(Plumbers Local #1)

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**POINTER, WATERPROOFER, CAULKER, SANDBLASTER,  
STEAMBLASTER**  
(Exterior Building Renovation)

**Journey person**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$53.42

Supplemental Benefit Rate per Hour: \$26.52

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

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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**ROOFER**

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

**Roofer**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$43.50**

Supplemental Benefit Rate per Hour: **\$33.81**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

**Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Memorial Day

Independence Day

Labor Day

Thanksgiving Day

Christmas Day

**Paid Holidays**

None

**Shift Rates**

Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential.

(Local #8)

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**SHEET METAL WORKER**

**Sheet Metal Worker**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.15**

Supplemental Benefit Rate per Hour: **\$50.55**

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$40.12**

Supplemental Benefit Rate per Hour: **\$50.55**

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

**Sheet Metal Worker - Duct Cleaner**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$16.08**

Supplemental Benefit Rate per Hour: **\$11.63**

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day

Martin Luther King Jr. Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

**Paid Holidays**

None

**Shift Rates**

Work that can only be performed outside regular working hours (eight hours of work between 7:30 A.M. and 3:30

P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate.

Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays.

(Local #28)

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**SHEET METAL WORKER - SPECIALTY  
(Decking & Siding)**

**Sheet Metal Specialty Worker**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER 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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$46.30

Supplemental Benefit Rate per Hour: \$25.95

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$28.50

Supplemental Benefit Rate per Hour: \$3.95

### Shipyard Mechanic - Second Class

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$19.07

Supplemental Benefit Rate per Hour: \$3.59

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

**Shipyard Laborer - First Class**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$23.40**  
Supplemental Benefit Rate per Hour: **\$3.75**

**Shipyard Laborer - Second Class**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$17.38**  
Supplemental Benefit Rate per Hour: **\$3.52**

**Shipyard Dockhand - First Class**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$21.57**  
Supplemental Benefit Rate per Hour: **\$3.68**

**Shipyard Dockhand - Second Class**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$17.28**  
Supplemental Benefit Rate per Hour: **\$3.52**

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

**SIGN ERECTOR**  
(Sheet Metal, Plastic, Electric, and Neon)

**Sign Erector**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$49.35

Supplemental Benefit Rate per Hour: \$54.63

**Overtime**

Time and one half the regular rate after a 7 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

Time and one half the regular rate for work on the following holiday(s).

**Paid Holidays**

New Year's Day

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Thanksgiving Day

Day after Thanksgiving

Christmas Day

**Shift Rates**

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

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**STEAMFITTER**

**Steamfitter I**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$57.50

Supplemental Benefit Rate per Hour: \$57.29

Supplemental Note: Overtime supplemental benefit rate: \$113.84

**Steamfitter -Temporary Services**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER 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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$43.70**

Supplemental Benefit Rate per Hour: **\$46.54**

### **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 work contracts with a dollar value not to exceed \$30,000,000 and for fire protection/sprinkler public work contracts not to exceed \$3,000,000.

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$57.50**

Supplemental Benefit Rate per Hour: **\$57.29**

Supplemental Note: Overtime supplemental benefit rate: **\$113.84**

### **Steamfitter -Temporary Services**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK  
CONSTRUCTION WORKER 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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$43.70**

Supplemental Benefit Rate per Hour: **\$46.54**

### **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 15% percent premium on wage and 15% percent premium on supplemental 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  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$42.35

Supplemental Benefit Rate per Hour: \$17.46

**Refrigeration and Air Conditioner Service Person V**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$34.80

Supplemental Benefit Rate per Hour: \$15.59

**Refrigeration and Air Conditioner Service Person IV**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$28.83

Supplemental Benefit Rate per Hour: \$14.05

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$24.74

Supplemental Benefit Rate per Hour: \$12.91

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$20.51

Supplemental Benefit Rate per Hour: \$11.83

**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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$15.01

Supplemental Benefit Rate per Hour: \$10.60

**Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

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

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).

New Year's Day  
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 - Setter**

(Assisted by Derrickperson and Rigger)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$54.17**

Supplemental Benefit Rate per Hour: **\$42.65**

**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

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

Washington's Birthday  
Good Friday  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

### **Paid Holidays**

1/2 day on Christmas Eve if work is performed in the A.M.

### **Shift Rates**

For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

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## **TAPER**

### **Drywall Taper**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$47.82**

Supplemental Benefit Rate per Hour: **\$26.81**

### **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  
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

(Local #1974)

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## **TELECOMMUNICATION WORKER**

(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects.)

### **Telecommunication Worker**

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$44.75**

Supplemental Benefit Rate per Hour: **\$23.15**

Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. \$22.84 for Staten Island only.

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Time and one half the regular rate for Sunday.

### **Overtime Holidays**

Time and one half the regular rate for work on the following holiday(s).

New Year's Day

Lincoln's Birthday

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

### **Paid Holidays**

New Year's Day

Lincoln's Birthday

Washington's Birthday

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

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

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: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: **\$42.72**  
Supplemental Benefit Rate per Hour: **\$33.57**

**Overtime**

Time and one half the regular rate after a 7 hour day.  
Time and one half the regular rate for Saturday.  
Double time the regular rate for Sunday.

**Overtime Holidays**

Double time the regular rate for work on the following holiday(s).  
New Year's Day  
President's Day  
Good Friday  
Memorial Day  
Independence Day  
Labor Day  
Columbus Day  
Veteran's Day  
Thanksgiving Day  
Day after Thanksgiving  
Christmas Day

**Paid Holidays**

None

**Shift Rates**

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

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$54.84**

Supplemental Benefit Rate per Hour: **\$38.32**

### 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

### Timberperson

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$50.05**

Supplemental Benefit Rate per Hour: **\$51.03**

### **Overtime**

Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

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: 7/1/2019 - 6/30/2020

Wage Rate per Hour: **\$65.42**

Supplemental Benefit Rate per Hour: **\$56.42**

### **Tunnel Workers (Compressed Air Rates)**

Includes shield driven liner plate portions or solidification portions work (8 hour shift) during excavation phase.

Effective Period: 7/1/2019 - 6/30/2020

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

Wage Rate per Hour: \$63.21  
Supplemental Benefit Rate per Hour: \$54.60

**Top Nipper (Compressed Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$62.02  
Supplemental Benefit Rate per Hour: \$53.57

**Outside Lock Tender, Outside Gauge Tender, Muck Lock Tender (Compressed Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$60.84  
Supplemental Benefit Rate per Hour: \$52.63

**Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$60.84  
Supplemental Benefit Rate per Hour: \$52.63

**Changehouse Attendant: Powder Watchperson (Compressed Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$53.40  
Supplemental Benefit Rate per Hour: \$49.60

**Blasters (Free Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$62.41  
Supplemental Benefit Rate per Hour: \$54.17

**Tunnel Workers (Free Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$59.72  
Supplemental Benefit Rate per Hour: \$51.89

**All Others (Free Air Rates)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$55.18  
Supplemental Benefit Rate per Hour: \$48.03

**Microtunneling (Free Air Rates)**

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

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$47.78

Supplemental Benefit Rate per Hour: \$41.51

### Overtime Description

For work performed during excavation and primary concrete tunnel lining phases - Double time the regular rate after an 8 hour day and Saturday, Sunday and on the following holiday(s) listed below.

For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, Saturday, Sunday and double time the regular rate for work on the following holiday(s) listed below.

For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.

For work not listed above - Time and one half the regular rate after an 8 hour day and Saturday and double time the regular rate on Sunday and on the following holiday(s) listed below.

### Paid Holidays

New Year's Day

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

(Local #147)

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## UTILITY LOCATOR

(Locate & mark underground utilities for street excavation.)

### Utility Locator (Year 7 and above)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$31.56

Supplemental Benefit Rate per Hour: \$1.93

### Utility Locator (Year 5 - 6)

Effective Period: 7/1/2019 - 6/30/2020

Wage Rate per Hour: \$22.85

Supplemental Benefit Rate per Hour: \$1.93

### Utility Locator (Year 4)

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

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$21.54  
Supplemental Benefit Rate per Hour: \$1.93

**Utility Locator (Year 3)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$20.30  
Supplemental Benefit Rate per Hour: \$1.93

**Utility Locator (Year 2)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$19.13  
Supplemental Benefit Rate per Hour: \$1.93

**Utility Locator (Year 1)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$18.04  
Supplemental Benefit Rate per Hour: \$1.93

**Utility Locator (Up to 1 year)**

Effective Period: 7/1/2019 - 6/30/2020  
Wage Rate per Hour: \$17.00  
Supplemental Benefit Rate per Hour: \$1.93  
Supplemental Note: No benefits for the first 90 days of employment.

**Overtime**

Time and one half the regular rate for work on the following Paid Holiday(s).  
Time and one half the regular hourly rate after 40 hours in any work week.

**Paid Holidays**

New Year's Day  
Memorial Day  
Independence Day  
Thanksgiving Day  
Christmas Day

**Shift Rates**

10% shift differential to employees working any shift starting between noon and 5 AM.

**Vacation**

For up to 1 year ..... 0 hours  
For year 1 - 2 ..... 48 hours per year  
For year 3 - 9 ..... 96 hours per year  
For year 10 or more ..... 144 hours per year

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

**Sick Days:**

For up to 1 year employee receives 40 hours paid sick leave.

For year 1 employee earns 2 hours of paid sick leave for every 100 overtime hours worked.

For year 2 - 9 years employee earns 4 hours of paid sick leave for every 100 overtime hours worked.

For year 10 or more employee earns 6 hours of paid sick leave for every 100 overtime hours worked.

(C.W.A.)

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**WELDER**

**TO BE PAID AT THE RATE OF THE JOURNEYPERSON IN THE TRADE  
PERFORMING THE WORK.**



**Department of  
Design and  
Construction**

Issue Date: July 1, 2019

**DDC STANDARD GENERAL CONDITIONS**

**FOR SINGLE CONTRACT PROJECTS**



**Department of  
Design and  
Construction**

Issue Date: July 1, 2019

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**DIVISION 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
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01 32 33	PHOTOGRAPHIC DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 35 03	GENERAL MECHANICAL REQUIREMENTS
01 35 06	GENERAL ELECTRICAL REQUIREMENTS
01 35 26	SAFETY REQUIREMENTS PROCEDURES
01 35 91	HISTORIC TREATMENT PROCEDURES
01 40 00	QUALITY REQUIREMENTS
01 42 00	REFERENCES
01 50 00	TEMPORARY FACILITIES, SERVICES AND CONTROLS
01 54 11	TEMPORARY ELEVATORS AND HOISTS
01 54 23	TEMPORARY SCAFFOLDING AND PLATFORMS
01 73 00	EXECUTION
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 39	CONTRACT RECORD DOCUMENTS
01 79 00	DEMONSTRATION AND OWNERS PRE-ACCEPTANCE ORIENTATION
01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
01 81 13.13	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 FOR MEP SYSTEMS
01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE



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**SECTION 01 10 00  
SUMMARY**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) 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 13.03 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS"; or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS", and the Addendum to the General Conditions.



**REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 C**

- C. **COMMISSIONING:** The project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15, GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE and the Addendum to the General Conditions. The Contractor 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:

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- 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:**

- A. Refer to Division I Section 01 33 00 – SUBMITTAL 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:**

- A. Refer to Division I Section 01 50 00 – TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

**1.9 DUST CONTROL:**

- A. 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



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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.



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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.
  - 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)**



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**END OF SECTION 01 10 00**

**SUMMARY  
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**SECTION 01 31 00  
PROJECT MANAGEMENT AND COORDINATION**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS", or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.
- C. COMMISSIONING: Refer to the Addendum to identify whether this project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE COMMISSIONING. The Contractor 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 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



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- 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.



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:**

- A. Copies of all correspondence to DDC shall be sent directly to the Resident Engineer at the job site.

**1.9 CONTRACTOR'S DAILY REPORTS:**

- A. 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 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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:**
1. 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:**
1. 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.
1. 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.
  2. 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:**
1. 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.
  2. 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 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.



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**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**



**SECTION 01 32 33  
PHOTOGRAPHIC DOCUMENTATION**

**REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 33**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 USB drive or other electronic media requested by the Commissioner 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 1 inch wide margins and punched for standard 3-ring binder.
  2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
    - a. Project Contract I.D. Number.
    - b. Project Contract Name.
    - c. Name of Contractor. (and Subcontractor Trade Represented)
    - d. Subject of Image Taken.
    - e. Date and time photograph was taken if not date stamped by camera.
    - f. Description of vantage point, indicating location, direction and other pertinent information.
    - g. Unique sequential identifier.
    - h. Name and address of photographer.

## **PART III – EXECUTION**

### **3.1 CONSTRUCTION PHOTOGRAPHS:**

- A. General: Take photographs 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 USB drive or other electronic media requested by the Commissioner 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.
  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 VIDEO RECORDING:**

- A. When Video Recording of Demonstration and Orientation sessions is required, 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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**SECTION 01 33 00  
SUBMITTAL PROCEDURES**

**PART 1 – GENERAL:**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 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 13.03 | SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS |
| H. | Section 01 81 13.04 | SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS |

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- 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:



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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



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(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.



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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.



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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



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- 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 13.03, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS; or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS, as applicable; Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS; Section 01 81 19, INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS and Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/or section 01 91 15 BUILDING ENCLOSURE 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 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS, or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.
  - 1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Sub-Section 1.6 of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS.

**1.8 ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:**

- A. In accordance with Section 01 10 00 Summary, 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 VIDEO RECORDINGS:**

- A. Submit construction progress photographs and Video recordings in accordance with requirements of Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION

**1.10 AS-BUILT DOCUMENTS:**

- A. Submit all as-built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.



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PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 33 00



**SECTION 01 35 03  
GENERAL MECHANICAL REQUIREMENTS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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:**

- A. 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:**

- A. Wherever field conditions are such that for proper execution of the work, reasonable changes in location of piping, ducts and equipment are necessary and required, the Contractor shall make such changes as directed and approved, without extra cost to the City.

**1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:**

- A. Piping, ducts and equipment 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:**

- A. 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:**

- A. 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:



1. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.
2. 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.
3. 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.
4. 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:**

- A. 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:**

- A. 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:**

- A. 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**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

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**SECTION 01 35 06  
GENERAL ELECTRICAL REQUIREMENTS**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**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:



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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 or holes pumped dry, backfilling, restoration of surfaces to original condition and removal of excess earth and rubbish from premises. During the work, the Contractor 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 an 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 ensure that the device terminations are adequate for the wire or cable (whose size may be larger than expected due to voltage drop considerations) connected to the device.

**REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5**

**3.5 CIRCUIT PROTECTIVE DEVICES:**

This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panel boards and Service Entrance.

**A. CIRCUIT BREAKERS:**

1. CIRCUIT BREAKERS: 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 Lamicaid 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: ½ 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 ½ horsepower or more, magnetic starters and circuit breakers shall be used. Single phase A.C. motors smaller than ½ horsepower or three-phase A.C. motors smaller than one (1) horsepower where manual control is specified may be furnished with starters of toggle



switch or push button type with inbuilt thermal protection. No additional disconnecting means is required to be furnished with this type of starter. This type of starter may also be used in series with automatic control devices such as thermostats, float and pressure switches, provided the individual motor or the sum of fractional horsepower motors is less than ½ horsepower. Means for manual operation 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**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

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**SECTION 01 35 26  
SAFETY REQUIREMENTS PROCEDURES**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements*". This document is included in the Information for Bidders.

**1.2 SUMMARY:**

- A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:
  - 1. Definitions
  - 2. Required Safety Meeting
  - 3. Compliance with Regulations
  - 4. Submittals
  - 5. Personnel Protective Equipment
  - 6. Hazardous and / or Contaminated Materials
  - 7. Emergency Suspension of Work
  - 8. Protection of Personnel
  - 9. Environmental Protection

**1.3 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Design Consultant: "Design Consultant" 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 Office of Environmental and Geotechnical Services (OEGS) 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 OEGS.

**PART II – PRODUCTS**

**2.1 PERSONNEL PROTECTIVE EQUIPMENT:**

- A. Special facilities, devices, equipment and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E and other applicable regulations.

**2.2 HAZARDOUS AND / OR CONTAMINATED MATERIALS:**

- A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous and / or contaminated.
- B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous and / or contaminated. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.
- C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.



**PART III – EXECUTION**

**3.1 EMERGENCY SUSPENSION OF WORK:**

- A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.
- B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.
- C. When, in the opinion of the Commissioner, the Contractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that work may resume.
- D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

**3.2 PROTECTION OF PERSONNEL:**

- A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.
- B. Whenever practical, the work area shall be fenced, barricaded or otherwise blocked off from the Public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00, TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including, without limitation, the following:
  - 1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
  - 2. Corridors, aisles, stairways, doors and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
  - 3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition or other hazardous activity.
  - 4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers, and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

**3.3 ENVIRONMENTAL PROTECTION:**

- A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.
- B. Comply with applicable federal, state and local noise control laws, ordinances and regulations, including but not limited to 29 CFR 1910.95; 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

**END OF SECTION 01 35 26**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
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**SECTION 01 35 91  
HISTORIC TREATMENT PROCEDURES**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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.
- 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:**

- A. Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

### **3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:**

- A. For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the work, 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 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

- A. This Section includes the following:
1. Definitions
  2. Conflicting Requirements
  3. Quality Assurance
  4. Quality Control
  5. Approval of Materials
  6. Special Inspections (Controlled Inspection)
  7. Inspections by Other City Agencies
  8. Certificates of Approval
  9. Acceptance Tests
  10. 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 13.03, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS" or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS."
- H. COMMISSIONING: Refer to the Addendum to identify whether 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 FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. 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.
- 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.



- 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.
- 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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**SECTION 01 42 00  
REFERENCES**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract 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



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



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AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSc	American Lumber Standard Committee, Incorporated
ALI	Automotive Lift Institute
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE/SEI	American Society of Civil Engineers, Structural Engineering Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	AWCI International (Association of the Wall and Ceiling Industry International)



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AWCMA	American Window Covering Manufacturers Association (Now WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWSC	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	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
CCFA	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



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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)
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
FEMEA	Federal Emergency Management Agency
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation)



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FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FMG	FM Global (Formerly: FM - Factory Mutual System)
FMRC	Factory Mutual Research (Now FMG)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Now GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
HUD	U.S. Department of Housing and Urban Development
IAPMO	International Association of Plumbing and Mechanical Officials
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation
ICC	International Code Council, Inc.
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.



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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
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



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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
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)



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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)
SAE	SAE International
SCAQMD	South Coast Air Quality Management District



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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



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TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute)
UL	Underwriters Laboratories Inc.
ULC	Underwriters Laboratories of Canada
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USC	United States Code
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTECC	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



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**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 42 00**

**REFERENCES  
01 42 00 - 13**



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(No Text on This Page)

REFERENCES  
01 42 00 - 14



**SECTION 01 50 00  
TEMPORARY FACILITIES, SERVICES AND CONTROLS**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

- A. This section includes the following:
1. Temporary Water System
  2. Temporary Sanitary Facilities
  3. Temporary Electric Power, Temporary Lighting System, And Site Security Lighting
  4. Temporary Heat
  5. Dewatering Facilities and Drains
  6. Temporary Field Office for Contractor
  7. Resident Engineer's Office
  8. Material Sheds
  9. Temporary Enclosures
  10. Temporary Partitions
  11. Temporary Fire Protection
  12. Work Fence Enclosure
  13. Rodent and Insect Control
  14. Plant Pest Control Requirements
  15. Project Identification Signage
  16. Security Guards/Fire Guards on Site
  17. Project Sign and Rendering
  18. Safety

**1.3 RELATED SECTIONS:** include without limitation the following:

- A. Section 01 10 00 SUMMARY
- B. Section 01 42 00 REFERENCES
- C. Section 01 54 11 TEMPORARY ELEVATORS AND HOISTS
- D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING
- E. Section 01 77 00 CLOSE OUT PROCEDURES

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.



- 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:
    - 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 (ccd)s. 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 the Contractor's 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 Contractor's 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:



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- 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



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- 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 FIELD 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.



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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.3, 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



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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



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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. ADDITIONAL REQUIREMENTS:
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.

**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 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 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**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

(No Text on This Page)



**SECTION 01 54 11  
TEMPORARY ELEVATORS AND HOISTS**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) 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**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

(No Text on This Page)



**SECTION 01 73 00  
EXECUTION**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 2 - PRODUCTS (Not Used)**

**PART 3 - 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. Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS" or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS".

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Alternative Daily Cover (ADC): Material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter and scavenging.



- 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. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.
- E. 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.
- F. 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.
- G. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
- H. 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.
- I. Return: To give back reusable items or unused products to vendors.
- J. Reuse: To reuse excess or discarded construction material in some manner on the Project site.
- K. Salvage: To remove a waste material from the Project site for resale or reuse.
- L. 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.
- M. 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.
- N. Waste-to-Energy: The conversion of non-recyclable waste materials into usable heat, electricity or fuel through a variety of processes, including combustion, gasification, pyrolyzation, anaerobic digestion and landfill gas recovery.

**1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:**

- A. The City of New York has established that this Project 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.** With the exception of LEED v4 projects with demolition ADC waste, a minimum of 75% of total Project demolition and construction waste (by weight) shall be diverted from landfill. LEED v4 projects with demolition ADC waste shall divert a minimum of 50% of total Project demolition and construction waste (by weight) 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. Do not use bulb crusher on site.
- F. Recycling on the job, subject to the Commissioner's approval, is encouraged on the site itself, such as the crushing and reuse of removed sound concrete and stone. Include these categories in the Waste Management Plan.
- G. Land-clearing debris is not considered construction, demolition or renovation waste and is not to be included as contribution to waste diversion.
- H. A minimum of five material types, both structural and nonstructural, are to be identified in the Construction Waste Management Plan for diversion.
- I. For LEED v4 projects, material to be used as ADC does not qualify as material diverted from disposal.

#### 1.6 REFERENCES, RESOURCES:

- A. DDC encourages its contractors to seek information from websites and experts in salvage or recycling in order to minimize disposal costs. There are numerous opportunities to sell, salvage, or to donate materials and accrue tax benefits (which would accrue to the contractor); there are also 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: <https://www1.nyc.gov/site/ddc/about/sustainable-design.page>. 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

<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.

3. For Waste-to-Energy Facilities that need to comply with European Standard (EN) for waste management and emissions into air, soil, surface water and groundwater:

[www.ec.europa.eu/environment/waste/framework/index.htm](http://www.ec.europa.eu/environment/waste/framework/index.htm) European Commission Waste Framework Directive 2008/98/EC

[http://www.europa.eu/legislation\\_summaries/environment/waste\\_management](http://www.europa.eu/legislation_summaries/environment/waste_management) European Commission Waste Incineration Directive 2000/76/EC

[www.cen.eu/cen/Products](http://www.cen.eu/cen/Products) EN standards 303-1, 303-2, 303-3, 303-4, 303-5, 303-6, 303-7

## 1.7 SUBMITTALS:

- A. The Contractor shall refer to Section 01 33 00 SUBMITTAL PROCEDURES for submittal requirements.
- B. 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.
- C. 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 on-site and/or off-site 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: Specify whether materials shall be separated or commingled and describe the planned diversion strategies. Describe expected amount of each material type, where materials shall be taken and how the recycling facility shall process the material. Provide a description of the means by which any recyclable, salvaged, or reused materials will be protected from contamination, and collected in a manner that will meet the requirements for acceptance by the designated recycling processors.
  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 and submitted on a monthly basis.
- D. FINAL WASTE MANAGEMENT PLAN. Within fifteen (15) days of Commissioner's approval of the Draft Waste Management Plan, the Contractor shall submit a Final Waste Management Plan.
- E. 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 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 tons/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.
- F. LEED Submittal: For LEED designated projects, submit final LEED construction waste report signed by the Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met. Waste report must include:
1. For diverted materials, include at least four material streams
  2. For commingled facilities, submit documentation of recycling rates
  3. For waste-to-energy strategy, submit documentation of facility adherence to relevant EN standards, and justification of strategy
- G. Refrigerant Recovery: Where refrigerant is recovered, submit statement of refrigerant recovery, which must include:
1. Name, address, qualification data and signature of the refrigerant recovery technician responsible for recovering refrigerant
  2. Statement that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations
  3. Date refrigerant was recovered

#### **1.8 QUALITY ASSURANCE:**

- A. The Contractor shall designate a Construction Waste Management Representative, 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
- E. For LEED v4 projects, Waste-to-Energy Facilities: Comply with EN standards for waste management and emissions into air, soil, surface water and groundwater.

## **PART II – PRODUCTS (Not Used)**

## **PART III – EXECUTION**

### **3.1 WASTE PLAN IMPLEMENTATION:**

- A. Prior to the demolition and construction start, the Contractor 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 commingled waste and/or separate all recyclable waste in accordance with the Plan. Specific areas on the Project site are to be designated, and appropriate containers and bins clearly marked with acceptable and unacceptable materials.
  2. Inspect containers and bins for contamination and remove contaminated materials if found.
  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**





**SECTION 01 77 00  
CLOSEOUT PROCEDURES**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 13.03, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 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 13.03, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.
8. Schedule applicable Demonstration and Orientation required in other Sections of the Project Specifications and as described in Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.
9. Deliver tools, 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 For MEP Systems and/ or Section 01 91 15, BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.



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**SECTION 01 78 39  
CONTRACT RECORD DOCUMENTS**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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.
1. The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed work, so that the Contract Record Drawings contain this information in exact detail and location. Contract Record Drawings shall also show all connections, valves, gates, switches, cut-outs and similar operating equipment.
  2. 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



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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



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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:



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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. Each manual shall contain the following materials, in the order listed:
1. Title page
  2. Table of contents
  3. Manual contents
- E. Arrange contents alphabetically by system, subsystem, and equipment and sequence of Table of Contents of the Project Manual. Cross-reference Specification Section numbers. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.
- F. Safety warnings or cautions 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.
- G. For each product or system, list names, addresses and telephone numbers of Subcontractors and Suppliers, including local source of supplies and replacement parts. Vendors and Supplier listings are to include names, addresses and telephone numbers, including nearest field service telephone numbers.
- H. Where contents of the manual include any manufacturer's catalog pages, clearly indicate the precise items and options included in the installation and delete all manufacturers' data regarding products not included in the installation.
- I. All material within manuals shall be new. Copies used for prior submittals or used in construction shall not be used.
- J. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.
- K. 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.
- L. Preliminary manual editions shall be as technically complete as the final manual edition. All illustrations shall be in final forms.
- M. 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.

- N. Building products, applied materials, and finishes: Include product data, with catalog number, size, composition, and color texture designations. Where applicable, provide information for re-ordering custom manufactured products.
- O. Instructions for care and maintenance: Include manufacturers' recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- P. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical compositions, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- Q. Additional Requirements: Specified in individual Specification Sections.

**2.6 DEMONSTRATION AND ORIENTATION DVD:**

- A. 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.



**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 78 39**



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**SECTION 01 79 00  
DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 79 00**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 video recordings.
- 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 For MEP Systems, and/ or Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS.

**1.3 RELATED SECTIONS: include without limitation the following:**

- A. Section 01 10 00 SUMMARY
- B. Section 01 33 00 SUBMITTAL PROCEDURES
- C. Section 01 77 00 CLOSEOUT PROCEDURES
- D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
- E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
- F. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS
- G. Specific requirements for demonstration and orientation indicated in other sections of the Project Specifications



#### 1.4 DEFINITIONS:

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- 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 orientation, submit three (3) complete training manual(s) and three (3) applicable video recording(s) to the Commissioner for the facility's and City's use.
- B. Qualification Data: For facilitator, instructor and Videographer.
- C. Attendance Record: For each orientation module, submit 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 orientation.
- F. Demonstration and Orientation Recordings:
  - 1. All Projects:
    - a. The Contractor shall submit to the Commissioner three (3) copies of Demonstration and Orientation Video recordings within seven (7) days of end of each orientation module.
    - b. Identification: On each copy, provide an applied label with the following information:
      - 1) Project Contract I.D. Number
      - 2) Project Contract Name
      - 3) Name of Contractor
      - 4) Name of Subcontractor as applicable
      - 5) Name of Design Consultant
      - 6) Name of Construction Manager as applicable
      - 7) Date recorded.
      - 8) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      - 9) Table of Contents including list of systems covered.
    - c. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD recording. Include name of Project and date of recording on each page.



- d. Commissioned Projects: The Contractor shall submit one (1) additional copy of the Demonstration and Orientation video recording to the Commissioning Agent through the Resident Engineer who will include the approved recording in the Commissioning Report.

#### **1.6 QUALITY ASSURANCE:**

- A. Facilitator Qualifications: A firm or individual experienced in orientation or educating maintenance personnel in an orientation program similar in content and extent to that indicated for this Project.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00, QUALITY REQUIREMENTS, experienced in operation and maintenance procedures and orientation.
- C. Videographer Qualifications: A professional Videographer who has experience with orientation and construction projects.
- D. Pre-instruction Conference: Schedule with the Resident Engineer a conference at Project site in accordance with Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and orientation including, but not limited to, the following:
  1. Inspect and discuss locations and other facilities required for instruction.
  2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  3. Review required content of instruction.
  4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

#### **1.7 COORDINATION:**

- A. Coordinate instruction schedule with the Resident Engineer and facility's operations. Adjust schedule as required to minimize disrupting facility's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of orientation modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the Commissioner.

### **PART II – PRODUCTS**

#### **2.1 INSTRUCTION PROGRAM:**

- A. Program Structure: Develop an instruction program that includes individual orientation modules for each system and equipment not part of a system, as specified and required by individual Specification Sections.
- B. Orientation Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
  1. 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.



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- 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 orientation modules, to coordinate instructors, and to coordinate between Contractor and the Resident Engineer for the number of participants, instruction times, and location.
- B. The Contractor 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 VIDEO RECORDINGS:**

- A. **All projects:**
  - 1. The Contractor shall engage a qualified commercial Videographer to video record demonstration and orientation sessions. Record each orientation module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
  - 2. At beginning of each orientation module, record each chart containing learning objective and lesson outline.
  - 3. All recordings must be close captioned.
  - 4. **Recording Format:** Provide high-quality video recording on USB drive or other electronic media requested by the Commissioner.
  - 5. **Recording:** Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and orientation. Display continuous running time.



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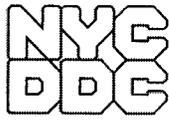
6. Narration: Describe scenes on the recording by audio narration by microphone while recording or by dubbing audio narration off-site after. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.
7. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from opposite the corresponding narration segment.

**B. Commissioned Projects:**

Refer to the Addendum to determine if the project is to be Commissioned.

1. The Commissioning Authority/Agent (CxA) under separate contract with the City of New York will assess and comment on the adequacy of the Orientation Instruction sessions by reviewing the Orientation and Instruction program and agenda provided by the Contractor. The provider of the Orientation program will video record the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor shall edit the recording per CxA comments.

**END OF SECTION 01 79 00**



**SECTION 01 81 13.03  
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.03**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

**A. LEED BUILDING - GENERAL REQUIREMENTS:**

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor 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:

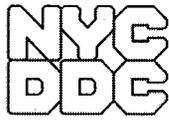
- |    |                     |   |
|----|---------------------|---|
| A. | Section 01 74 19    | CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL  |
| B. | Section 01 81 13.13 | VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS |
| C. | Section 01 81 19    | INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS  |
| D. | Section 01 91 13    | GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS  |
| E. | Section 01 91 15    | GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE   |

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.



- 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 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.

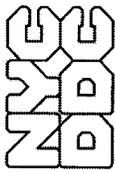
#### **1.9 QUALITY ASSURANCE:**

- 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 13.03**



**Department of Design and Construction**

**ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM**

Contractor Name: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Contractor Contact: \_\_\_\_\_  
 Project I.D.: \_\_\_\_\_  
 Telephone Number: \_\_\_\_\_

Product/Manufacturer	Recycled Content		Regional <sup>4</sup>		Rapidly Renewable <sup>7</sup>		VOC content <sup>8</sup>		Flooring <sup>9</sup>	Wood		
	Material Cost <sup>1</sup>	Pre-Consumer (% by wt) <sup>2</sup>	Post-Consumer (% by wt) <sup>3</sup>	Total % (1/2 Pre + Post)	Location & Distance to Extraction <sup>5</sup>	Location & Distance to Manufacture <sup>6</sup>	Extracted & Manuf. (% by wt)	*VOC content listed			*VOC content allowed	*Green Label or FloorScore

<sup>1</sup>Material Cost: As it appears on the manufacturer's or distributor's invoice to the contractor or subcontractor. Does not include labor or equipment costs associated with installation.  
<sup>2</sup>Pre-Consumer Recycled Content: Industrial/manufacturing waste material (e.g., fly-ash and synthetic gypsum, both waste products from coal burning electricity plants) diverted from landfill and incorporated into a finished product. Scrap raw materials that can be reused in the same manufacturing process from which they are recovered are not considered Pre-Consumer Recycled Content.  
<sup>3</sup>Post-Consumer Recycled Content: Material or product that has served its intended consumer use (e.g., an empty plastic bottle) and has been diverted from landfill and incorporated into a finished product.  
<sup>4</sup>Regional: Refers to a material/product that is BOTH extracted AND manufactured within 500 miles of the Project site. Record this information ONLY for materials/products meeting BOTH of these criteria.  
<sup>5</sup>Extraction: Refers to the location from which the raw resources used in a building product are extracted, harvested, or recovered.  
<sup>6</sup>Manufacture: Refers to the location of the final assembly of components into a building product that is furnished and installed by the Contractor.  
<sup>7</sup>Rapidly Renewable: Refers to materials/products derived from agricultural products that are typically harvested within a ten-year or shorter cycle.  
<sup>8</sup>VOC Content: The quantity of volatile organic compounds contained in adhesives, sealants, paints and architectural coatings. Reported in grams/liter or lbs/gallon, less water.  
<sup>9</sup>Flooring: For carpet, indicate Carpet and Rug Institute (CRI) Green Label Plus certification. For carpet cushion, indicate CRI Green Label certification. For all flooring except unfinished/untreated wood and mineral-based flooring (tile, masonry, terrazzo, cut stone) without organic-based coatings or sealants, indicate Resilient Floor Covering Institute FloorScore rating. VOC limits for adhesives, sealants, etc. still apply.  
<sup>10</sup>Added Urea Formaldehyde: Applies to composite wood and aggrifiber products only (plywood, particleboard, MDF, OSB, wheatboard, strawboard). Resins or binders with added urea formaldehyde are prohibited.  
<sup>11</sup>FSC Certified: Certification from the Forest Stewardship Council. This column is only applicable to wood products.  
 \* Applies only to materials/products installed within the weather barrier.

Contractor Certification: \_\_\_\_\_ a duly authorized representative of \_\_\_\_\_ (the Contractor) hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by the Contractor as components of the final building construction. Furthermore, I understand that any change in such qualifications during the purchasing period will require prior written approval from the Commissioner.  
 Signature of Authorized Representative: \_\_\_\_\_ Date: \_\_\_\_\_



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

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**SECTION 01 81 13.04  
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.04**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

**A. LEED BUILDING - GENERAL REQUIREMENTS:**

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific Project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor 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
6. VOC Requirements for Interior Adhesives and Sealants
7. VOC Requirements for Interior Paints and Coatings
8. Low-Emitting Materials, Flooring
9. Low-Emitting Materials, Composite Wood
10. Low-Emitting Materials, Ceilings, Walls, Thermals and Acoustic Insulation
11. Low-Emitting Materials, Furniture
12. Low-Emitting Materials, Exterior Applied Products
13. Low-Emitting Materials, Additional Low-Emitting Requirements

**C. This Section includes requirements for Volatile Organic Compound (VOC) emissions and content in specific materials used within the Project.**

**D. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints, coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products, 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, coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products, the requirements set forth in this Section shall prevail.**



**1.3 RELATED SECTIONS:** Include without limitation the following:

- |    |                  |   |
|----|------------------|---|
| A. | Section 01 74 19 | CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL                |
| B. | Section 01 81 19 | INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS        |
| C. | Section 01 91 13 | GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS        |
| D. | Section 01 91 15 | GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE |

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Adhesive: Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers.
- C. 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.
- D. 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.
- E. Bio-based materials: Composed in whole or in significant part of biological products, renewable agricultural materials or forestry materials, and must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material.
- F. Building Exterior: A structure's primary and secondary weatherproofing system, including waterproofing membranes and air- and water-resistant barrier materials, and all building elements outside that system.
- G. Building Interior: Everything inside a structure's weatherproofing membrane.
- H. 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).
- I. Certified Wood: See Forest Stewardship Council (FSC) Certified Wood.
- J. Clear Wood Finish: Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film.
- K. 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.



- L. 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.
- M. Cradle-to-Gate Assessment: Analysis of a product's partial life cycle, from resource extraction to the factory gate, before it is transported for distribution and sale.
- N. 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.
- O. Enclosure: The exterior plus semi-exterior portions of the building. Exterior consists of the elements of a building that separate conditioned spaces from the outside (i.e., the wall assembly). Semi-exterior consists of the elements of a building that separate conditioned space from unconditioned space or that encloses semi-heated space through which thermal energy may be transferred to or from the exterior or conditioned or unconditioned spaces (e.g., attic, crawl space, basement).
- P. Environmental Product Declaration (EPD): A statement that the item meets the environmental requirements of, ISO 14025, 14040 and EN 15804, or ISO 21930 and have at least a cradle-to-gate scope.
- Q. Extended Producer Responsibility: A waste management strategy, also known as closed-loop program or product take-back, where the manufacturer's responsibility for a product is extended to the post-consumer stage of the product's life-cycle.
- R. Floor Coating: Opaque coating applied to flooring. Excludes industrial maintenance coatings.
- S. Forest Stewardship Council (FSC) Certified Wood: Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
- T. 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.
- U. Inherently Non-Emitting Materials: Products that are inherently non-emitting sources of VOCs, including stone, ceramic, powder-coated metals, plated or anodized metals, glass, concrete, clay brick, unfinished solid wood, untreated solid wood. These materials are considered compliant without VOC testing if they do not include integral organic-based surface coatings, binders or sealants.
- V. Lacquer: Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film.
- W. LEED: The Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council (USGBC).
- X. Life-Cycle Assessment: An evaluation of the environmental effects of a product from cradle to grave, as defined by ISO 14040-2006 and ISO 14044-2006.
- Y. Mutagen: A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarding as if they induce heritable mutations in the germ cells of humans, under the Harmonized



System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).

- Z. 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.
  
- AA. Paint: A pigmented coating. For the purposes of this specification, paint primers are considered to be paints.
  - a. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter).
  - b. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter).
  - c. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter).
  - d. Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
  
- BB. Permanently Installed Building Product: See Product.
  
- CC. 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.
  
- DD. Product: An item that arrives on the Project site either as a finished element ready for installation or as a component to another item assembled on-site. The product unit is defined by the functional requirement for use in the Project; this includes the physical components and services needed to serve the intended function of the permanently installed building product. Similar products within a specification shall each contribute as a separate product.
  
- EE. Product-Specific Declaration: Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle-to-gate scope.
  
- FF. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer) or after consumer use (post-consumer). Recycled content claims for products must conform to the definition in ISO 14021-1999, Environmental Labels and Declarations, Self-Declared Environmental Claims (Type II Environmental Labeling).
  - a. 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.
  - b. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.
  - c. "Pre-consumer" may also be referred to as "post-industrial".
  
- GG. Regionally Manufactured Materials: Materials that are manufactured, distributed and purchased within a radius of 100 miles from the Project location. Manufacturing refers to all points of manufacture for an assembly of components.
  
- HH. Regionally Extracted, Harvested, or Recovered Materials: Materials which are extracted, harvested or recovered, manufactured, distributed and purchased within a radius of 100 miles from the Project site.



- II. 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.).
- JJ. 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).
- KK. Sealant: Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints between surfaces. Includes sealant primers and caulks.
- LL. 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.
- MM. 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.
- NN. Stain: Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
- OO. 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.
- PP. Volatile Aromatic Compound: Any hydrocarbon compound containing one or more 6-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
- QQ. Volatile Organic Compound (VOC): Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs. Waterproofing Sealer: A coating that prevents the penetration of water into porous substrates.

#### **1.5 LEED PROVISIONS:**

- A. Refer to the Addendum for the LEED rating to be achieved for this Project. The provisions to achieve this LEED rating are integrated within the Project construction documents and specifications. Additional LEED requirements are met through aspects of the Project design, including material and equipment selections, which may not be specifically identified as LEED Building requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

#### **1.6 LEED BUILDING SUBMITTALS:**

- A. Scope: LEED Building Submittals are required for all permanently installed materials included in General Construction work. For Plumbing, Mechanical and Electrical work, LEED Building Submittals are only required for field-applied adhesives, sealants, paints and coatings. Voluntary inclusion of system components such as piping, pipe insulation, ducts, conduits, plumbing fixtures, faucets and lamp housings shall be consistently applied to the Project's LEED credits. Submit all required LEED Building Submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.



- B. Applicability: The extent of the LEED Building Submittals varies depending on the specification section. Applicable LEED Building Submittals are listed under the "LEED Building Submittals" heading in each specification section. The detailed requirements for the LEED Building Submittals are defined in Sub-Section 1.6 C below.
- C. Detailed Requirements: Sub-Sections 1.6 C.1 through 1.6 C.18 below define the information and documents to be submitted for each type of LEED Building Submittal as identified in the LEED Building Submittals heading in each specification section:
1. LEED v4 Material and Resources (MR) Credits Calculator for Building Product Disclosure and Optimization (Disclosure and Optimization Calculator): With each submittal of a product permanently installed in the Project, the Contractor shall be responsible for the completion of the Disclosure and Optimization Calculator, which can be found on USGBC's website. The Contractor shall maintain an updated Disclosure and Optimization Calculator for all applicable products throughout the Project duration and submit the updated calculator on a monthly basis.
    - a. The Disclosure and Optimization Calculator shall record the information outlined in Items b.-c. below for all permanently installed products, the information outlined in Item d. below for all permanently installed concrete mixes, and the information outlined in Items e.-i. below for all permanently installed products that have the content, disclosure or optimization characteristics described herein:
    - b. Cost breakdowns for the materials included in the contractor or sub-contractor's scope of work. Cost reporting shall include itemized material costs (excluding the contractor's labor, equipment, overhead and profit).
    - c. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).
      - 1) For each product with recycled content, also indicate the total recycled content value ( $1/2 \times \text{pre-consumer percentage} \times \text{product value} + 1 \times \text{post-consumer percentage} \times \text{product value} = \text{total recycled content value}$ ).
      - 2) See additional requirements for concrete in section 1.6.C.1.d below.
    - d. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
      - 1) For each concrete mix, submit a complete breakdown of all components, by weight and by cost.
    - e. Identification (Yes/No) of materials manufactured, distributed and purchased within 100 miles of the Project site AND containing raw materials harvested or extracted within 100 miles of the Project site, if used in the Project, as well as the following information:
      - 1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
      - 2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the Project site.
    - f. The percentage (by cost) of "Forest Stewardship Council (FSC) Certified" wood products, if used in the Project.
      - 1) Record all new wood products, indicating which are FSC-certified. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.
      - 2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.
    - g. The number or percentage of products with Environmental Product Declarations (EPD), with fractional or multiplied values as indicated below. If a product used in the Project has an EPD Declaration, submit one of the following:
      - 1) EPD:



- i. Product-Specific Declaration: Valued as one quarter (1/4) of a product
    - ii. Industry-Wide (Generic) EPD: Valued as one half (1/2) of a product
    - iii. Product-Specific Type III EPD: Valued as one whole product
  - 2) Documentation of third-party certification of impact reduction below industry average for at least three of the following categories, valued at 100%:
    - i. Global warming potential (greenhouse gases), in CO<sub>2</sub>e;
    - ii. Depletion of the stratospheric ozone layer, in kg CFC-11;
    - iii. Acidification of land and water sources, in moles H<sup>+</sup> or kg SO<sub>2</sub>;
    - iv. Eutrophication, in kg nitrogen or kg phosphate;
    - v. Formation of tropospheric ozone, in kg NO<sub>x</sub> or kg ethene; and depletion of nonrenewable energy resources, in MJ.
  - 3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site, it is valued as two times the whole product.
  - 4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.
- h. The number or percentage of products for which Sourcing of Raw Materials has been documented, with fractional or multiplied values as indicated below. If a product used in the Project has documented Sourcing of Raw Materials, submit one of the following:
  - 1) Corporate sustainability report (CSR). Submit one of the following:
    - i. Manufacturer's self-declared report: valued as half of a product
    - ii. Third-party verified CSR which include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain: valued as one whole product:
      1. Global Reporting Initiative (GRI) Sustainability Report
      2. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises
      3. U.N. Global Compact: Communication of Progress
      4. ISO 26000: 2010 Guidance on Social Responsibility
      5. Other USGBC approved programs meeting the CSR criteria
  - 2) Documentation of at least one of the responsible extraction criteria below:
    - i. Extended producer responsibility program, valued as half of a product
    - ii. Bio-based materials, valued as one whole product
    - iii. Certified Wood: Wood-based materials include all materials made from wood, including engineered wood products and wood-based panel products, valued as one whole product
    - iv. Material Reuse: Materials may be salvaged, refurbished, or reused, valued as one whole product.
    - v. Recycled content. The sum of post-consumer recycled content plus one-half the pre-consumer recycled content, based on cost, valued as one whole product.
    - vi. Other USGBC approved programs meeting leadership extraction criteria
  - 3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product.
  - 4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products. Products meeting multiple criteria may only be counted once.



- i. The number or percentage of products for which Material Ingredients have been disclosed, with fractional or multiplied values as indicated below. If a product used in the Project discloses its Material Ingredients, submit one of the following:
  - 1) Chemical inventory of the product to at least 0.1% (1000 ppm), documented by one of the following:
    - i. Manufacturer Inventory
    - ii. Health Product Declarations (HPDs)
    - iii. Cradle to Cradle (C2C) certifications
    - iv. Declare product labels
    - v. ANSI/BIFMA e3 Furniture Sustainability Standard (Furniture may be included, providing it is included consistently in all MR Credits.)
  - 2) Documentation of compliance with one of the following material ingredient optimization criteria programs:
    - i. GreenScreen benchmarks
    - ii. Cradle to Cradle certifications
    - iii. REACH optimizations
    - iv. Other USGBC approved programs meeting building product optimization criteria
  - 3) Documentation that the product is sourced from a manufacturer that meets all of the below supply chain optimization criteria:
    - i. Manufacturer engages in validated and robust safety, health, hazard and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material
    - ii. Manufacturer provides independent third party verification of the following conditions for their supply chain, at a minimum:
      1. Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
      2. Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
      3. Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
      4. Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
      5. Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
      6. Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain
  - 4) For 2) and 3) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product. Products compliant with both 2) and 3) may only be counted once.
  - 5) For 1), 2), and 3) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.
2. LEED v4 Indoor Environmental Quality Credit Low-Emitting Materials Calculator (EQ Calculator). With each relevant product submittal, the Contractor shall be responsible for the completion of the EQ Calculator, which can be found on USGBC's website. The Contractor shall maintain an updated EQ Calculator throughout the Project duration for all applicable products and submit the updated calculator on a monthly basis.



- a. The EQ Calculator shall record information for all relevant products as outlined below. Include the following documentation. Detailed requirements are listed in b. – j. below.
- 1) VOC content of all field-applied interior adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
  - 2) General Emissions Evaluation for more than 90 percent of all field-applied interior paints, coatings, adhesives, and sealants, by volume, and for 100 percent of all flooring, ceilings, walls, and thermal and acoustic insulation.
  - 3) Composite Wood Evaluation for all composite wood not covered by other categories.
  - 4) Furniture Evaluation for 90% of all furniture, by cost.
  - 5) For schools/healthcare only: Exterior-Applied Products Evaluation for 90% of all exterior applied materials, measured by volume. All batt insulation products shall contain no added formaldehyde.
- b. VOC REQUIREMENTS, GENERAL: The following materials must meet the listed compliance requirements for emissions and content standards, for all applicable categories. All products shall comply with each applicable threshold requirement. Refer to LEED BD+C Reference Guide, EQ Credit Low-Emitting Materials for additional guidance.
- 1) General Emissions Requirements: Products must demonstrate they have been tested and determined compliant in accordance with California Department of Public Health (CDPH), Standard Method v1.1-2010, using the applicable exposure scenario, and stating the range of total VOCs (TVOC) after 14 days measured as specified in the CDPH Standard Method v1.1 as follows:
    - i. 0.5mg/m<sup>3</sup> or less;
    - ii. between 0.5 and 5.0 mg/m<sup>3</sup>; or,
    - iii. 0.50 mg/m<sup>3</sup> or more
  - 2) 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.
  - 3) No product shall contain the following:
    - i. methylene chloride
    - ii. 1,1,1-trichloroethane
    - iii. benzene
    - iv. toluene
    - v. ethylbenzene
    - vi. vinyl chloride
    - vii. naphthalene
    - viii. 1,2-dichlorobenzene
    - ix. di (2-ethylhexyl) phthalate
    - x. butyl benzyl phthalate
    - xi. di-n-butyl phthalate
    - xii. di-n-octyl phthalate
    - xiii. diethyl phthalate
    - xiv. dimethyl phthalate
    - xv. isophorone
    - xvi. antimony
    - xvii. cadmium
    - xviii. hexavalent chromium
    - xix. lead
    - xx. mercury
    - xxi. formaldehyde



- xxii. methyl ethyl ketone
  - xxiii. methyl isobutyl ketone
  - xxiv. acrolein
  - xxv. acrylonitrile
- 4) No product shall contain more than 1.0% by weight of sum total of volatile aromatic compounds.
- c. VOC REQUIREMENTS FOR INTERIOR ADHESIVES AND SEALANTS:
- 1) For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the following limits for VOC content when calculated according to South Coast Air Quality Management District (SCAQMD) Rule #1168 requirements in effect on July 1, 2005, and rule amendment date January 7, 2005:

	Allowable VOC Content (g/L):
<b>Architectural Applications:</b>	
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
<b>Specialty Applications:</b>	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Computer diskette manufacturing	350
Contact adhesive	80
Special purpose contact adhesive	250
Tire retread	100
Adhesive primer for traffic marking tape	150
Structural wood member adhesive	140
Sheet applied rubber lining operations specialty	850
Top and Trim adhesive	250
<b>Substrate Specific Applications:</b>	
Metal to metal substrate specific adhesives	30
Plastic foam substrate specific adhesives	50
Porous material (except wood) substrate specific adhesives	50
Wood substrate specific adhesives	30
Fiberglass substrate specific adhesives	80
<b>Sealants:</b>	
Architectural sealant	250



Marine deck sealant	760
Nonmember roof sealant	300
Roadway sealant	250
Single-ply roof membrane sealant	450
Other sealant	420
<b>Sealant Primers:</b>	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775
Modified bituminous sealant primer	500
Marine deck sealant primer	760
Other sealant primer	750
Other	
Other adhesives, adhesive bonding primers, adhesive primers or any other primers	250

- 2) For field applications that are inside the weatherproofing system, a minimum of 90 percent of adhesives and sealants, by volume, shall comply with the requirements of the CDPH "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- d. VOC REQUIREMENTS FOR INTERIOR PAINTS AND COATINGS:
- 1) For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content when calculated according to the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the SCAQMD Rule #1113, effective June 3, 2011.

Product Type:	Allowable VOC Content (g/L):
Bond Breaker	350
Clear wood finishes - Varnish	275
Clear wood finishes – Sanding Sealer	275
Clear wood finishes - Lacquer	275
Colorant – Architectural Coatings, excluding IM coatings	50
Colorant – Solvent Based IM	600
Colorant - Waterborne IM	50
Concrete – Curing compounds	100
Concrete – Curing compounds for roadways & bridges	350
Concrete surface retarder	50
Driveway Sealer	50
Dry-fog coatings	50
Faux finishing coatings - Clear topcoat	100
Faux finishing coatings – Decorative Coatings	350
Faux finishing coatings - Glazes	350
Faux finishing coatings - Japan	350
Faux finishing coatings – Trowel applied coatings	50
Fire-proof coatings	150
Flats	50
Floor coatings	50



Form release compounds	100
Graphic arts (sign) coatings	150
Industrial maintenance coatings	100
Industrial maintenance coatings – High temperature IM coatings	420
Industrial maintenance coatings – Non-sacrificial anti-graffiti coatings	100
Industrial maintenance coatings – Zinc rich IM primers	100
Magnesite cement coatings	450
Mastic coatings	100
Metallic pigmented coatings	150
Multi-color coatings	250
Non-flat coatings	50
Pre-treatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Roof primers, bituminous	350
Rust preventative coatings	100
Stone consolidant	450
Sacrificial anti-graffiti coatings	50
Shellac- Clear	730
Shellac – Pigmented	550
Specialty primers	100
Stains	100
Stains, interior	250
Swimming pool coatings – repair	340
Swimming pool coatings – other	340
Traffic Coatings	100
Waterproofing sealers	100
Waterproofing concrete/masonry sealers	100
Wood preservatives	350
Low solids coatings	120

- 2) For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- e. LOW-EMITTING MATERIALS, FLOORING: Flooring shall comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- f. LOW-EMITTING MATERIALS, COMPOSITE WOOD: Composite wood, agrifiber products, and adhesives shall be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the CARB's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
- g. LOW-EMITTING MATERIALS, CEILINGS, WALLS, THERMAL, AND ACOUSTIC INSULATION: Ceilings, walls, and thermal and acoustic insulation shall comply with the



- requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- h. **LOW-EMITTING MATERIALS, FURNITURE:** At least 90 percent of furniture, measured by cost, shall be tested in accordance with ANSI/BIFMA Standard Method M7.1-2011; comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach; and model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate.
  - i. **LOW-EMITTING MATERIALS, EXTERIOR APPLIED MATERIALS (HEALTHCARE/ SCHOOLS ONLY):** At least 90 percent of exterior applied materials, measured by volume, shall comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
    - 1) The following materials are prohibited and do not count toward total percentage compliance:
      - a) Hot-mopped asphalt for roofing.
      - b) Coal tar sealants for parking lots and other paved surfaces.
  - j. **LOW-EMITTING MATERIALS, ADDITIONAL LOW-EMITTING REQUIREMENTS:** If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.
    - 1) If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
    - 2) Methylene chloride and perchloroethylene may not be intentionally added in adhesives, sealants, paints or coatings.
3. **BACK-UP DOCUMENTATION:** For each material listed in the Disclosure and Optimization Calculator or the EQ Calculator, provide and submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, including but not limited to the documentation to certify the material's LEED Building attributes, as applicable:
- a. **RECYCLED CONTENT:** Submit published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.
  - b. **REGIONAL SOURCING (WITHIN 100 MILES):** Submit published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered, manufactured, distributed and the distance in miles from the Project site.
    - 1) If only some of the raw materials for a particular product or assembly originate within 100 miles of the Project site, provide the percentage (by weight) that these materials comprise in the complete product.
  - c. **BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION:** Submit published third-party or manufacturer's product literature or letter of certification, on the third-party or manufacturer's letterhead, certifying the documented disclosure and optimization information.
  - d. **VOC EMISSIONS AND CONTENT:** Submit Material Safety Data Sheets (MSDS), for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products. MSDS shall indicate the VOC emissions and content of products submitted. (If an MSDS does not include a product's VOC emissions and content, then product data sheets, manufacturer literature, or



a letter of certification from the manufacturer shall be submitted in addition to the MSDS to indicate the VOC emissions and content). Submit product third-party certificates and test reports, stating the testing methodology and the model, to include units that are consistent with those required. For wet-applied products, the manufacturer's documentation must state each product's classification and application according to the referenced standard's definition.

4. **PRODUCT CUT SHEETS:** Submit product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.
5. **FSC-CERTIFIED WOOD:** If FSC-Certified Wood is used in the Project, submit:
  - a. Copies of vendor's invoices itemizing all new wood purchases, showing the cost for each line item.
  - b. For FSC-certified products, the vendor invoice shall list product's FSC content percent and its Chain-of-Custody (CoC) certification number.
  - c. For FSC-certified products, submit the product and producer's CoC certificates.
  - d. For FSC-certified products modified on-site, submit on-site installer's CoC certification.
  - e. For assemblies, submit the percentage (by cost and by weight) of the assembly that is FSC-certified wood and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.
6. **HIGH ALBEDO PAVING AND WALKWAY MATERIALS:** For paving and walkway materials made from concrete or brick, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum 3-year aged Solar Reflectance (SR) value of 0.28. If 3-year aged value information is not available, submit published product literature or letter verifying an initial SR value of at least 0.33 at installation.
7. **HIGH ALBEDO ROOFING MATERIALS:** For exposed roofing membranes, pavers, and ballast products, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values, calculated according to ASTM E 1980. Reflectance 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.
  - a. 82 for initial SRI, or 64 for 3-year aged SRI for low-sloped roofing applications (slope  $\leq$  2:12)
  - b. 39 for initial SRI or 32 for 3-year aged SRI for steep-sloped roofing applications (slope  $>$  2:12)
8. **LOW MERCURY LAMPS:** For all fluorescent, compact fluorescent and HID lamps installed in the Project, submit the total number of each lamp type and submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following information. Preheat, T-9, T-10 and T-12 fluorescents or mercury vapor high-intensity discharge (HID) lamps shall not be installed in the Project. For healthcare projects only, probe-start metal halide HID lamps shall not be installed in any interior spaces.
  - a. The mercury content or content range per lamp in milligrams or picograms, meeting the following criteria;

Lamp	Maximum Mercury Content (milligram)
T-8 fluorescent, eight-foot	10 mg
T-8 fluorescent, four-foot	3.5 mg
T-8 fluorescent, U-bent	6 mg
T-5 fluorescent, linear	2.5 mg
T-5 fluorescent, circular	9 mg
Compact fluorescent, nonintegral ballast	3.5 mg
Compact fluorescent, integral ballast	3.5 mg, ENERGY STAR qualified
High-pressure sodium, up to 400 watts	10 mg
High-pressure sodium, above 400 watts	32 mg



- b. The design light output per lamp (light at 40% of a lamp's useful life) in lumens; and
  - c. The rated average life of the lamp in hours.
- 9. EXIT SIGNS: Illuminated exit signs shall not contain mercury, and shall use less than 5 watts of electricity.
- 10. CONCRETE: Submit concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state of New York.
- 11. INTERIOR LIGHTING FIXTURES: For each lighting fixture type installed within the building's weather barrier, submit manufacturer's cut sheets indicating the following:
  - a. Fixture power in watts.
  - b. Initial lamp lumens.
  - c. Photometric distribution data.
  - d. Dimming capability, in range of percentages.
- 12. EXTERIOR LIGHTING FIXTURES: For each lighting fixture type installed on site, submit manufacturer's cut sheets indicating the following:
  - a. Fixture power in watts.
  - b. Initial lamp lumens.
  - c. Photometric distribution data.
  - d. Range of field adjustability, if any.
  - e. Warranty of suitability for exterior use.
- 13. ALTERNATIVE TRANSPORTATION: Submit manufacturer's cut sheets and/or shop drawings for the following items installed on site:
  - a. Bike racks, including total number of bicycle slots provided.
  - b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.
- 14. WATER CONSERVING FIXTURES: For all water consuming plumbing fixtures and fittings, submit manufacturer's cut sheets showing maximum flow rates and/or flush rates.
- 15. ENERGY SAVING APPLIANCES: Submit manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:
  - a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
  - b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
  - c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
  - d. Commercial food service equipment.
- 16. GLAZING: For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, submit manufacturer's cut sheets indicating the following:
  - a. Glazed area.
  - b. Visible light transmittance.
  - c. Solar heat gain coefficient.
  - d. Fenestration assembly u-factor.
- 17. VENTILATION: Submit manufacturer's cut sheets for the following:
  - a. Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.



- b. Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS.
18. REFRIGERATION: For all refrigeration equipment, submit manufacturer's cut sheets indicating the following:
- a. Equipment type.
  - b. Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
  - c. Refrigerant type.
  - d. Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
  - e. Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
  - f. Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

#### **1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:**

- A. The LEED Building Submittal information 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.
- B. All final LEED Building Submittal information with back-up documentation shall be submitted within two (2) months of the Project's substantial completion. If in the Project's LEED review, the USGBC or their third party reviewer requires additional documentation as it relates to the LEED Building Submittals, the Contractor shall provide the requested documentation within two (2) weeks.

#### **1.8 LEED ACTION PLANS:**

- A. Construction Waste Management Plan- Refer to Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for detailed requirements.
- B. Construction IAQ Management Plan- Refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS for detailed requirements.
- C. Erosion and Sedimentation Control (ESC) Plan:
  - 1. The Plan shall be in accordance with the New York State Department of Environmental Conservation (NYSDEC)'s New York State Standards and Specifications for Erosion and Sediment Control (Blue Book) or the 2012 EPA Construction General Permit, whichever is more stringent.
  - 2. The Plan 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 and include timing of implementation.
    - d. Submit site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, inlet/catch basin protection and perimeter controls.



- e. Establish and clearly delineate construction buffer zones to avoid soil compaction and other construction damage to greenfields.
- f. Describe the inspection and maintenance protocols of the ESC measures. Submit a construction schedule indicating weekly site review.
- g. Describe reporting and documentation measures.
4. Detailed requirements: ESC Tracking Log
  - a. Note date of major rain events, describe damage, describe any repairs or maintenance of specific control measures performed, and note responsible party.
  - b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Submit date-stamped photographs, inspection reports or other recording processes.
  - c. Submit monthly.
5. Implementation
  - a. Before Demolition and/or Construction begins, the Contractor 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 monthly, and for assembling the required LEED documentation.
  - b. The Contractor shall be responsible for the provision, maintenance, and repair of all ESC measures. Any problems identified in site inspections shall be resolved in a timely manner.
  - c. Demonstration. The Contractor shall provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.
  - d. All sub-contractors shall promptly notify the ESC Representative if damage to an ESC measure is observed.
  - e. Meetings. Urgent or ongoing ESC issues shall be discussed at weekly on-site job meetings.
6. All projects, including zero lot line buildings and projects that cause minimal or even no exterior site disturbance, must have ESC Plan that meets requirements.
7. Contractor shall save such original documents for the life of the Project plus seven (7) years.

#### **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 monthly, and for assembling the required LEED documentation. The Contractor shall facilitate measurements taken by authorized parties on site for LEED compliance verification purposes.
- 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 LEED v4 MR Credits Calculator for Building Product Disclosure and Optimization, the LEED v4 EQ Credit Low-Emitting Materials Calculator, and any other forms or templates required for the subcontractors to record LEED documentation. The Contractor shall also be responsible for collecting and compiling Building Product Disclosure and Optimization and Low-Emitting Materials information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.
- D. Meetings: Sustainable design and construction issues shall be discussed at the following meetings in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION:
  1. Demolition kick-off meeting
  2. Construction kick-off meeting
  3. Construction kick-off meeting for LEED (independent meeting)
  4. Weekly job-site progress and coordination meetings



5. Closeout meeting

**1.10 REFERENCES:**

- A. New York State Standards and Specifications for Erosion and Sediment Control, amended November 2016: [http://www.dec.ny.gov/docs/water\\_pdf/2016nysstanec.pdf](http://www.dec.ny.gov/docs/water_pdf/2016nysstanec.pdf)
- B. 2012 EPA Construction General Permit: <https://www.epa.gov/npdes/epas-2012-construction-general-permit-cgp-and-related-documents>
- C. South Coast Air Quality Management District (SCAQMD), Rule 1168: [www.aqmd.gov](http://www.aqmd.gov)
- D. South Coast Air Quality Management District (SCAQMD), Rule 1113: [www.aqmd.gov](http://www.aqmd.gov)
- E. CDPH Standard Method v1.1-2010: [www.cal-iaq.org](http://www.cal-iaq.org)
- F. ISO 17025: [www.iso.org](http://www.iso.org)
- G. ISO Guide 65: [www.iso.org](http://www.iso.org)
- H. CARB 93120 ATCM: [arb.ca.gov/toxics/compwood/compwood.htm](http://arb.ca.gov/toxics/compwood/compwood.htm)
- I. ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating: [bifma.org](http://bifma.org)
- J. ANSI/BIFMA e3-2011 Furniture Sustainability Standard: [bifma.org](http://bifma.org)
- K. ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): [iso.org](http://iso.org)
- L. ISO 14025–2006, Environmental labels and declarations (Type III Environmental
- M. Declarations—Principles and Procedures): [iso.org](http://iso.org)
- N. ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: [iso.org](http://iso.org)
- O. ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: [iso.org](http://iso.org)
- P. International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: [iso.org](http://iso.org)
- Q. Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): [ftc.gov/bcp/gnrnrule/guides980427.htm](http://ftc.gov/bcp/gnrnrule/guides980427.htm)
- R. Global Reporting Initiative (GRI) Sustainability Report: [globalreporting.org/](http://globalreporting.org/)
- S. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational
- T. Enterprises: [oecd.org/daf/internationalinvestment/guidelinesformultinationalenterprises/](http://oecd.org/daf/internationalinvestment/guidelinesformultinationalenterprises/)
- U. U.N. Global Compact, Communication of Progress: [unglobalcompact.org/cop/](http://unglobalcompact.org/cop/)
- V. ISO 26000—2010 Guidance on Social Responsibility: [iso.org/iso/home/standards/iso26000.htm](http://iso.org/iso/home/standards/iso26000.htm)
- W. Forest Stewardship Council: [ic.fsc.org](http://ic.fsc.org)
- X. Sustainable Agriculture Network: [sanstandards.org](http://sanstandards.org)
- Y. The Rainforest Alliance: [rainforest-alliance.org/](http://rainforest-alliance.org/)
- Z. ASTM Test Method D6866: [astm.org/Standards/D6866.htm](http://astm.org/Standards/D6866.htm)
- AA. Chemical Abstracts Service: [cas.org/](http://cas.org/)
- BB. Health Product Declaration: [hpdcollaborative.org/](http://hpdcollaborative.org/)



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- CC. Cradle-to-Cradle CertifiedCM Product Standard: [c2ccertified.org/product\\_certification](http://c2ccertified.org/product_certification)
- DD. Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH):  
[echa.europa.eu/support/guidance-on-reach-and-clp-implementation](http://echa.europa.eu/support/guidance-on-reach-and-clp-implementation)
- EE. GreenScreen: <https://www.greenscreenchemicals.org/method/greenscreen-list-translator>

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 81 13.04**



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**SECTION 01 81 13.13  
VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR  
LEED v3 BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.13**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY:**

- A. This Section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for the project.
- B. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints and coatings 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 v3 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

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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

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES,  
SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS



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-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
- 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)

#### 1.7 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

- A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as “products”) 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

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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

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- |    |  |     |
|----|--|-----|
| 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:
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.

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 13.03 SUSTAINABLE REQUIREMENTS FOR LEED v3 BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 81 13.13**



**SECTION 01 81 19  
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

**1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:**

- A. The City of New York has determined that this Project 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. Division 9 (of the Specifications): Finishes.
- C. Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS" or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS".
- D. Refer to the Addendum to identify whether this project is designed to comply with Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS
- E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- 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", Second Edition, 2007, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, [www.smacna.org](http://www.smacna.org).
- B. ANSI/ASHRAE 52.2-2007, "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 Construction IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. 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", Second Edition, 2007.
  - 2. Absorptive materials shall be protected from moisture damage when stored on-site and after installation.
  - 3. The planned operation of air handlers during construction shall be described. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grille and return or transfer duct inlet opening, such that there is no bypass around the filtration media, as determined by ASHRAE 52.2-2007.
  - 4. Filtration media shall be replaced immediately prior to occupancy. Filtration media shall have a MERV of 13 as determined by ASHRAE 52.2-2007.
  - 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. The use of tobacco products shall be prohibited inside the building and within 25 feet of the building entrance during construction.



7. A flush-out or air testing shall be performed.
8. 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. Detailed requirements of the Construction IAQ Management Plan are as follows:**

1. SMACNA Guidelines: Chapter 3 of the referenced "IAQ Guidelines for Occupied Buildings Under Construction", outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan 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.
    - 7) To reduce debris and contamination to mechanical systems, do not store materials in mechanical rooms.
  - b. Source Control
    - 1) Protect stored on-site or installed absorptive or porous materials. Store materials in dry conditions indoors, under cover, and off the ground or floor.
    - 2) Do not use wet or damaged porous materials in the building. Materials which become contaminated through direct exposure to moisture from precipitation, plumbing leaks, or condensation shall be replaced by the Contractor, at no additional cost to the City of New York.
    - 3) Use low-toxicity and low-VOC materials to the greatest extent possible.
    - 4) Recover, isolate, and ventilate containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications.
    - 5) Prevent exhaust fumes from idling vehicles, equipment, and fossil-fueled tools from entering the building.
    - 6) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, shall be closed when not in use.
    - 7) Enforce the no-smoking job site policy.
  - 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.
    - 6) Provide walk-off mats at entryways to reduce introduced dirt and pollutants.
    - 7) Use dust guards and collectors on saws and other tools.
  - d. Housekeeping
    - 1) Store materials on elevated platforms under cover, in a designated dry, clean location, prior to unpacking for installation.



- 2) If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.
  - 3) Institute cleaning activities to remove contaminants from the building prior to occupancy. Clean all coils, air filters, and ductwork prior to performing testing, adjusting, and balancing of HVAC systems.
  - 4) Sweep the work area on a daily basis. Use an efficient and effective dust collecting method such as damp cloth, wet mop, or vacuum with high-efficiency particulate filters. Activities which produce high levels of dust 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) Keep materials organized to improve job safety as well as indoor air quality.
  - e. Scheduling
    - 1) Phase construction such that absorptive materials are installed only in areas that are weathertight.
    - 2) Schedule activities that utilize "sources" of VOC contamination to take place prior to installing high absorbent materials that will act as "sinks" for contaminants.
    - 3) Review of the appropriate components of the Construction IAQ Management Plan 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 "Source Control" 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 shall also describe corrective measures to be taken if moisture damage does occur to absorptive materials during the course of construction (see Section 1.7 B.1.b).
  3. Replacement of Filtration Media: Under the "HVAC Protection" section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment 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. Pre-Occupancy Phase: Perform either a flush-out or air sample testing (Options 1 or 2), as follows:
    - a. OPTION 1 — Flush-Out
      - 1) Perform flush-out using either Path 1 or Path 2.
        - i. Path 1: After construction ends, prior to occupancy and with all interior finishes installed, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cu.ft. of outdoor air per sq.ft. of floor area while



maintaining an internal temperature of at least 60 degrees F and no higher than 80 degrees F and relative humidity no higher than 60%.

- ii. Path 2: If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu.ft. of outdoor air per sq.ft. of floor area to the space. Once a space is occupied, it 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 IEQ Prerequisite: Minimum Indoor Air Quality Performance, 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.
- 2) Commissioning can occur during flush-out, at the discretion of the Commissioning Agent, provided none of the commissioning procedures introduce contaminants into the space and none of the flush-out procedures circumvent the commissioning process. Complete testing and balancing of the HVAC system after the flush-out is complete. Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS.
- 3) If even partial construction work occurs during the flush-out, the flush-out must be started again from the beginning for that space. If multiple, discrete HVAC systems operate independently, flush-out may be completed in portions of the building as work is completed in each area served by a given system.

OR

b. OPTION 2 — Air Testing

- 1) Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with current versions of the United States Environmental Protection Agency Compendium of Methods for the Determination of Air Pollutants in Indoor Air or ISO methods, as additionally detailed in the LEED BD+C Reference Guide.
- 2) Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

CONTAMINANT	MAXIMUM CONCENTRATION
Formaldehyde	27 parts per billion
Particulates (PM10 for all buildings; PM25 for buildings in EPA nonattainment areas, or local equivalent)	PM10: 50 micrograms per cubic meter PM25: 15 micrograms per cubic meter
Ozone (for buildings in EPA nonattainment areas)	0.075 parts per million
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
Target chemicals listed in CDPH Standard Method c1.1, Table 4-1, except formaldehyde	CDPH Standard Method v1.1-2010, Allowable Concentrations, Table 4-1
Carbon Monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels

- 3) The air sample testing shall be conducted as follows:



- i. 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.
  - ii. 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 required to be in place for the testing.
  - iii. Prior to air sample testing, all punch-list items that would generate VOCs or other contaminants, the testing and balancing of the HVAC system and finalization of all cleaning shall be complete. Use low-emitting cleaning products and vacuum cleaners with HEPA filtration.
  - iv. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points 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.
  - v. 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.
  - vi. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.
6. Implementation and Coordination: Before Demolition and/or Construction begins, the Contractor shall implement the Construction IAQ Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction IAQ Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of the Construction IAQ Management Plan with the Commissioner monthly and for assembling the required LEED documentation. Include provisions in the Construction IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.
- a. Distribution: The Contractor 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, as applicable, Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

- A. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.7 herein.
- B. IAQ Tracking Log
  1. Note date of observed major Construction IAQ issues, describe any damage, describe any repairs or maintenance of specific control measures performed and note responsible party.
  2. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Provide date-stamped photographs, inspection reports or other recording processes.



3. Submit monthly.
- 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 Contactor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the Project.
- C. PHOTOGRAPHS: Submit to the Commissioner a minimum of 18 photographs as required under the provision for Special Photographs, in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION, comprised of at least six photographs taken on three different occasions during construction of each IAQ measure. The photographs 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 Testing, Adjusting and Balancing (TAB) 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. Include the Construction IAQ Management Plan requirements in contract agreements with subcontractors. Familiarize subcontractors with the plan and how it will affect their daily activities. Hold a subcontractors' orientation meeting to review the plan requirements.
- 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.
- C. Include construction IAQ progress check-ins as a regular item in weekly subcontractor meetings and safety meetings. Provide a copy of the plan on site, posted in an accessible area.

**PART II – PRODUCTS (Not Used)**

**PART III – EXECUTION (Not Used)**

**END OF SECTION 01 81 19**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

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**SECTION 01 91 13  
GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. The Owner's Project Requirements (OPR) and Basis of Design (BOD) documents are included by reference for information only.
- C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

**1.2 SUMMARY:**

This Section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems, and equipment being commissioned. General Requirements for Building Enclosure Commissioning are addressed in a separate specification.

- A. This Section includes:
  - 1. Definitions
  - 2. Commissioning Team
  - 3. City's Responsibilities
  - 4. Contractor's Responsibilities
  - 5. CxA Responsibilities
  - 6. Commissioning Documentation
  - 7. Submittals
  - 8. Coordination
  - 9. Execution

**1.3 RELATED SECTIONS: Include without limitation the following:**

- A. System-Specific Commissioning requirements indicated in other sections of the Project Specifications for specific requirements for commissioning systems.
- B. This Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning 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



7. Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

**1.4 DEFINITIONS:**

- A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.
- B. Basis of Design (BOD): A document, prepared by the Design Consultant, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- C. Checklists: Forms that outline the step by step process that must be executed to fulfill the test requirements and to verify that materials, equipment, assemblies, and systems are installed in accordance with the Contract Documents. The CxA shall develop the checklists; the Contractor shall complete them.
- D. Commissioning: Commissioning is a systematic process of ensuring and documenting that the building systems, including the mechanical and electrical systems, have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing contractors to provide a finished product.
- E. Commissioning Agent (Aka Commissioning Authority) (CxA): Consultant under separate contract with the City of New York to provide Commissioning Services for this project. The CxA shall not be an employee of the Contractor, nor shall the CxA have any interest in the Contract.
- F. Commissioning Plan: A document developed by the CxA that outlines the organization, schedule, roles and responsibilities, allocation of resources, and documentation requirements of the commissioning process.
- G. Deferred Performance Tests: Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.
- H. 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.
- I. Factory Testing: Testing of equipment on-site or at the factory, by factory personnel, with or without an owner's representative.
- J. Functional Performance Test (FPT): Functional performance testing includes the dynamic functions and operations of equipment and systems using manual or monitoring methods under various levels of operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarms, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to respond as the sequences state. Such tests shall be performed as per the protocol written by the CxA, defining the methods, personnel, and expectations.



- K. Issue (or Deficiency): A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the Contract Documents.
- L. Issues Log: A formal and ongoing record of problems, deficiencies or concerns that have been raised by members of the Commissioning Team during the course of commissioning. The issues log is the primary tracking tool to address all commissioning issues by concerned parties. All issues must be addressed and resolved by the concerned parties before the closeout of the Project. This log tracks the resolution performed and date of closure of each issue.
- M. Master Equipment List (MEL): A complete listing of all commissioned building equipment, including details such as make, model, location, ID Tag number, etc. that is taken from submittals and is the basis from which checklists will be generated. The MEL is a spreadsheet which is also used as a tracking tool for all milestones of the commissioning process, such as the creation and performance of checklists, startup of equipment, TAB work, etc.
- N. Monitoring: The recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or the trending capabilities of control systems.
- O. Owner (City of New York) Contracted Tests: Tests paid for by the City of New York outside of the Contractor's Contract and for which the CxA does not provide oversight. These tests will not be repeated during functional testing if properly documented.
- P. Owner's (City of New York) Project Requirements (OPR): A document, prepared by the Design Consultant that details the functional requirements of a Project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- Q. Pre-functional (Installation) Checklists: A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the CxA to the Contractor. Installation checklists are primarily static inspections and procedures to prepare equipment or systems for initial operation. Pre-functional (Installation) checklists augment, and are combined with, the manufacturer's startup checklist. The Checklists are filled out by the Contractor and reviewed by the CxA.
- R. Sampling: Functional testing for a percentage of the total number of identical or near-identical pieces of equipment.
- S. Seasonal Performance Tests: Functional tests that are deferred until, or performed again when, the system(s) will experience climate conditions close to their design conditions.
- T. Startup: The initial starting or activating of equipment, including executing construction checklists.
- U. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.
- V. Systems Manual: A system-focused composite document that includes the Operation and Maintenance Manual, and additional information of use to the owner during the occupancy and operations phase.
- W. Testing, Adjusting, and Balancing (TAB): Testing, adjusting, and balancing of the Heating Hot Water (HHW), Chilled Water (CHW) and Heating, Cooling, and Ventilation Airflow distribution system flows and pressures as specified in Contract Documents by a subcontractor certified to perform such work.



- X. Test requirements: Requirements specifying what modes and functions, etc. shall be tested on any given piece of equipment or any given system (integrated or standalone). The test requirements are not the detailed test procedures. The test requirements for each system are specified in the respective Contract Documents.
- Y. Trending: Monitoring using the building controls system, and analysis of the data gathered over a period of time.

**1.5 COMMISSIONING TEAM:**

- A. Members Appointed by the Contractor and its Subcontractors: Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The Commissioning Team shall consist of, but not be limited to, representatives of the Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by the City:
  - 1. Commissioning Authority/Agent (CxA): The designated person, company, or entity under separate Contract with the City that plans, schedules, and coordinates the Commissioning Team to implement the commissioning process.
  - 2. Representatives of the facility user and operation and maintenance personnel.
  - 3. Design Consultant and other concerned entities.

**1.6 CITY'S RESPONSIBILITIES:**

- A. Provide the OPR and BOD documentation to the CxA for use in developing the Commissioning Plan; systems manual; operation and maintenance orientation plan; and testing plans and checklists.
- B. Assign operation and maintenance personnel to participate in Commissioning Team activities.
- C. Provide full details and results of any Owner Contracted tests relevant to the current Project.

**1.7 CONTRACTOR'S RESPONSIBILITIES:**

- A. The Contractor shall provide utility services required for the commissioning process.
- B. As a member of the Commissioning Team, the Contractor and subcontractor(s) shall assign representatives with expertise and authority to act on behalf of the Contractor and its subcontractor(s) and schedule them to participate in and perform Commissioning Team activities including, but not limited to, the following:
  - 1. Participate in scheduled construction-phase coordination and Commissioning Team meetings.
  - 2. Integrate and coordinate commissioning process activities with the construction schedule.
  - 3. Provide any and all factory acceptance test reports to the CxA through the Commissioner.
  - 4. Respond to any additional specific information requests from the CxA. CxA may request additional documentation necessary for the commissioning process. Requests by CxA may precede, be concurrent with, or follow normal submittals.
  - 5. Ensure the cooperation and participation of all subcontractors and manufacturers of equipment to be commissioned.
  - 6. Verify and confirm that components, equipment, and system are functioning as per design prior to CxA witnessing testing.
  - 7. Perform testing required in the Commissioning Schedule as per the Commissioning Process test procedures provided by the CxA, providing no less than 48 hours' notice to the CxA through the Commissioner.



8. Complete installation checklists as Work is completed and return to CxA through the Commissioner.
9. Provide written responses to the CxA through the Commissioner for resolution of issues recorded in the Issues Log within five (5) business days.
10. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
11. Submit As-Built documents, operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS. Such documents shall be submitted prior to functional testing.
12. Provide orientation sessions for operation and maintenance personnel (sessions will be witnessed by the CxA) in accordance with Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION. Provide no less than 48 hours' notice to the CxA, through the Commissioner. Video record and edit orientation sessions and provide DVD to the CxA and Commissioner no later than two weeks after the orientation session occurs. Edit as requested by the Commissioner.

**1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:**

- A. Organize and lead the Commissioning Team.
- B. Prepare a construction-phase Commissioning Plan. Collaborate through the Commissioner with each Contractor and with subcontractors to develop test and inspection procedures. Include design changes and coordinate commissioning activities with the overall Project schedule. Identify Commissioning Team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task. Update the Commissioning Plan during construction as required.
- C. Review and comment in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, on submittals from the Contractor for compliance with the OPR, BOD, Contract Documents, and construction-phase Commissioning Plan. Review and comment on performance expectations of systems and equipment and interface between systems relating to the OPR and BOD.
- D. Coordinate with the Commissioner, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, to convene Commissioning Team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes.
- E. At the beginning of the construction phase, coordinate with the Commissioner's kick-off meeting schedule to conduct an initial construction-phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals, operation and maintenance orientation sessions, TAB Work, testing, and Project completion.
- F. Perform site visits to observe and inspect construction as described in the Commissioning Plan. Report progress and deficiencies to the Commissioner. In addition to compliance with the OPR, BOD, and Contract Documents, inspect systems and equipment installation for adequate accessibility required for component maintenance replacement and repair.
- G. Prepare and distribute project-specific test and inspection procedures and checklists and maintain a Master Equipment List.
- H. Verify air and water systems balancing by sampling, by reviewing completed reports, and by selected site observation. Coordinate submittal reviews with the Commissioner so that the comments are combined into a single review and submitted to the Contractor.
- I. Coordinate with the Commissioner to witness and document tests, inspections, and systems startup, as per the Commissioning Plan.



- J. Maintain an issues log and a record of functional testing. Report all issues as they occur to the Commissioner.
- K. Compile test data, inspection reports, and certificates and include them in the systems manual and Commissioning Report.
- L. Certify date of acceptance and startup for each item of equipment for start of warranty periods.
- M. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BOD, and Contract Documents. Operation and maintenance documentation requirements are specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.
- N. Review agenda for orientation; witness and confirm orientation session conforms with agenda and Contract Documents; review recording of demonstration and orientation sessions provided by the Contractor on USB drive or other electronic media as requested by the Commissioner and provide appropriate comments for editing.
- O. Return to the site 10 months into the 12-month guaranty period, to review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Interview facility staff and identify problems or concerns they have with operating the building as originally intended.
- P. Prepare Commissioning Reports.
- Q. Assemble the final commissioning documentation, including the Commissioning Report and Systems Manual.
- R. Perform all CxA tasks as defined by LEED; prepare LEED submittal documents.

#### **1.9 COMMISSIONING DOCUMENTATION:**

The Contractor shall assist the CxA in the development and compiling of the following Commissioning Documentation:

- A. Index of Commissioning Documents: The CxA will prepare an index including the storage location of each document.
- B. Commissioning Plan: A document prepared by the CxA that outlines the schedule, allocation of resources, roles and responsibilities, and documentation requirements of the commissioning process.
- C. Test Checklists: The CxA will develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. The CxA will prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Space will be provided for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in other sections of the Project Specifications, but shall include without limitation:
  - 1. Identification of tested item
  - 2. Date of test
  - 3. Indication of whether the record is for a first test or retest following correction of a problem or issue
  - 4. Dated signatures of the person performing the test and of the witness if applicable
  - 5. Deficiencies and issues, if any, generated as a result of the test



- D. Inspection Checklists will be signed by the Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.
- E. Test and Inspection Reports: The CxA will record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application will be included with data. CxA shall compile test and inspection reports and test and inspection certificates and include them in systems manual and Commissioning Report.
- F. Corrective Action Documents: The CxA will document corrective action taken for systems and equipment that fail tests and include required modifications to systems and equipment and revisions to test procedures, if any. The Contractor shall retest systems and equipment requiring corrective action. The CxA will document retest results.
- G. Issues Log: The CxA will prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the OPR, BOD, and Contract Documents. The log will identify and track issues as they are encountered, documenting the status of unresolved and resolved issues. The Issues Log will identify, at a minimum:
  - 1. The party responsible for correcting the issue,
  - 2. The person documenting the issue resolution,
  - 3. The exact location of the issue (floor and room),
  - 4. The applicable system component,
  - 5. A detailed description of the issue,
  - 6. The issue status, and
  - 7. The date the issue was discovered and the date the issue was resolved.
- H. Commissioning Report: The CxA will document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BOD, and Contract Documents. The Commissioning Report shall include:
  - 1. An Executive Summary, including participants and their roles, a brief building description, an overview of the commissioning and testing scope, and a general description of testing and verification methods,
  - 2. Installation/ Pre-Functional Checklists,
  - 3. Start-up Reports,
  - 4. Functional Test documentation,
  - 5. Trend Log Analysis,
  - 6. The final Issues Log, with all issues identified through the commissioning process, identifying which, if any, issues remain unresolved,
  - 7. The Commissioning Plan,
  - 8. Commissioning progress and field reports,
  - 9. Commissioning review documents, and
  - 10. Record of Owner's Orientation.



- I. Systems Manual: The CxA will gather required information and compile systems manual as specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

#### **1.10 SUBMITTALS:**

- A. Submittal of shop drawings, product data, samples, etc., relevant to commissioning shall be provided to the CxA as requested. Such submittals shall be in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.
- B. As-Built Contract Record Drawings and Operating and Maintenance Manuals relevant to commissioning shall be provided to the CxA as requested. Such submittals shall be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
- C. All demonstration and orientation submittals relevant to commissioning shall be provided to the CxA as requested. Such submittals shall be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.
- D. Completed Prefunctional (Installation) Checksheets shall be provided to the CxA.

#### **1.11 COORDINATION:**

- A. Coordination of Commissioning is the responsibility of all Commissioning Team members.
- B. Coordinating Meetings: The CxA will coordinate with the Commissioner's regularly scheduled construction progress meetings to conduct coordination meetings of the Commissioning Team to review progress on the Commissioning Plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities. Commissioner and Contractor shall ensure that all required Commissioning Team members attend.
- C. Construction Documents: The Contractor, through the Commissioner, will furnish copies of all construction documents, addenda, change orders and appropriate submittals and shop drawings to the CxA.
- D. Pre-testing Meetings: The CxA will coordinate with the Commissioner to conduct pretest meetings of the Commissioning Team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested. Commissioner and Contractor shall ensure that all required Commissioning Team members attend.
- E. Testing Coordination: Contractor shall coordinate schedule times with the Commissioning Team, through the Commissioner, for tests, inspections, obtaining samples, and similar activities. The CxA will advise the Commissioning Team as to the sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
- F. Manufacturers' Field Services: The Contractor shall coordinate manufacturers' field services, as per the Commissioning Plan.
- G. The CxA will regularly apprise the Commissioner of progress, pending problems and/or disputes, as well as provide regular status reports on progress with each system.



## **PART II – PRODUCTS**

### **2.1 TEST EQUIPMENT**

- A. All industry standard test equipment required for performing the specific tests shall be provided by the Contractor responsible for testing. Any proprietary Vendor-specific test equipment shall be provided by that Vendor or Manufacturer.
- B. Special equipment, tools, instruments, software, and equipment communication network access hardware and software (only available from Vendor, specific to the piece of equipment) required for testing equipment according to the Contract Documents shall be included at no extra cost to the City and shall be turned over to the City at Project close-out, except for stand-alone data logging equipment that may be used by the CxA.
- C. Any portable or handheld setup and/or calibration devices required to initialize the control system shall be made available by the control vendor for use by the CxA at no additional cost to the City.
- D. The instrumentation used in the commissioning process shall comply with the following:
  - 1. Be of sufficient quality and accuracy to test and/or measure system performance within the tolerances required
  - 2. Be calibrated at the manufacturer's recommended intervals with calibration tags permanently affixed to the instrument
  - 3. Be maintained in good repair and operating condition throughout use duration on this Project
  - 4. Be immediately recalibrated or repaired if dropped and/or damaged in any way during this Project.

## **PART III – EXECUTION**

### **3.1 COMMISSIONING PROCESS**

- A. The following provides an overview of the Commissioning tasks during Project construction and the general order in which they occur.
  - 1. Construction-phase Commissioning begins with a Commissioning Kickoff Meeting, conducted by the CxA through the Commissioner in accordance with section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, where the Commissioning process is reviewed with all the Commissioning Team Members.
  - 2. Additional meetings may be required throughout construction, scheduled by the CxA through the Commissioner in accordance with 01 31 00 PROJECT MANAGEMENT AND COORDINATION with necessary parties attending, to plan, scope, coordinate and schedule future activities and resolve open issues.
  - 3. The CxA will review the Contractor submittals concurrent with the Commissioner and provide comments to the Commissioner for inclusion in their review. The reviewed submittals will include all commissioned equipment information, including detailed startup procedures, and coordination drawings that include commissioned equipment and systems, control drawings and sequences, and interfaces and interlocks between systems.
  - 4. The CxA works with the Commissioner and Contractor in developing Pre-functional and Functional Test documentation formats.
  - 5. Periodically throughout the construction process, the CxA will perform site visits to observe component and system installations.
  - 6. The checkout and performance verification generally proceeds from component level to equipment to systems and intersystem levels. Pre-functional (Installation) Checklists are to be completed before Functional Performance Checklists.



7. The Contractor shall, with guidance from the CxA, execute and document the Pre-Functional (Installation) Checklists and perform startup and initial checkout of equipment and systems. The CxA documents that the checklists and startup are completed according to the approved plans. This will include the CxA witnessing selected assembly markups, portions of the startup of selected equipment, and spot checking the Pre-Functional (Installation) Checklists.
8. The CxA develops specific equipment and system Functional Checklists. The Contractor receives a copy of the procedure through the Commissioner. The CxA may request additional design narrative from the Commissioner and Controls Contractor, depending on the completeness of the Basis of Design and sequences provided within the design documents.
9. The Functional Checklists are executed by the Contractor and witnessed and documented by the CxA.
10. Items of non-compliance in material, installation startup, and operation are corrected and the equipment or system is rechecked. The CxA will maintain an Issues Log to track issues and issue resolution.
11. The CxA will review the Operation & Maintenance documentation for completeness.
12. Commissioning, excluding the Warranty Walkthrough, shall be completed prior to Substantial Completion.
13. The CxA reviews the orientation documentation. The orientation schedules and agenda are provided by the subcontractors. The CxA verifies that orientation is completed, attended by the appropriate City of New York personnel, is thorough and provides all necessary information required to operate and service the equipment or system.
14. Deferred testing/ checkouts are conducted, as specified or required in the Contract Documents.

### **3.2 COMMISSIONING PLAN AND SCHEDULE**

- A. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. After the initial construction phase Commissioning kickoff meeting, the CxA will update the plan. This plan is a living document that shall evolve and expand as the Project progresses. The Commissioning Plan shall include:
  1. Description of the facility and Project.
  2. Description of the commissioning process and associated deliverable documents.
  3. Description of equipment and systems to be commissioned.
  4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.
  5. Sample rates for equipment to be tested.
  6. Identification of task items that must be completed before the next operation can proceed.
  7. Description of responsibilities of Commissioning Team members.
  8. Description of observations to be made and reported on during testing and witnessing of testing by all parties involved in the Project.
- B. Commissioning Schedule: Contractor shall provide construction schedules to the CxA, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. The CxA will develop and submit a schedule identifying the commissioning process and provide commissioning scheduling information to the Commissioner and Contractor for review and planning activities. The Contractor shall incorporate the CxA's activities into the Project schedule.



### 3.3 TESTING PROCEDURES

- A. The CxA will determine and document the acceptance procedures for each system within disciplines. The acceptance procedures shall incorporate the commissioning standards and successful testing results as referred to throughout the Specifications.
- B. The CxA will provide performance checklists and performance checkout data sheets for each system based on actual system configuration. Special emphasis shall be placed on checkout procedures that shall conclusively determine actual system performance and compliance with the OPR and BoD.
- C. The Contractor and appropriate Vendor(s) shall be informed of what tests are to be performed and the expected results. The Commissioning Plan shall address the test requirements and be distributed to all parties involved with that system.
- D. Prior to Functional Testing, the Contractor shall provide the following:
  - 1. Contractor shall certify in writing that commissioned systems, subsystems, and equipment have been installed, calibrated and started, and are operating according to the Contract Documents.
  - 2. Contractor shall certify in writing that all relevant instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.
  - 3. Contractor shall certify in writing that TAB procedures have been completed, and that the TAB report has been submitted, discrepancies corrected, and corrective work approved.
  - 4. Contractor shall perform tests for system and intersystem performance only after CxA and Commissioner have approved the completed testing checklists for systems, subsystems, and equipment.
- E. The Functional Performance tests shall be performed by the Contractor and Vendor(s) with oversight by the CxA. The CxA shall witness, verify, and document these tests.
  - 1. Functional Performance Tests shall include operating the systems and components through each of the written sequences of operation, other significant modes of miscellaneous alarms, power failure, and security alarm when impacted by and interlocked with commissioned equipment, as detailed in the Commissioning Plan.
  - 2. Checklists shall be completed comprehensively and to the extent necessary to enable the CxA to assure the Commissioner that the systems perform as per the OPR, BOD, and Contract Documents.
  - 3. If a test is failed for any reason and retesting is required, the Contractor shall provide retesting at no additional cost to the City.
  - 4. After testing, Contractor shall return settings to normal operating conditions.

### 3.4 OPERATION & MAINTENANCE MANUALS

- A. General
  - 1. The CxA shall review the Operation & Maintenance manuals provided by the Contractor for completeness of the document. The review process shall verify that Operation & Maintenance instructions meet Specifications and are included for all commissioned equipment furnished by the Contractor.
  - 2. Published literature shall be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.
  - 3. The Contractor shall incorporate the standard technical literature into system specific formats for this facility as designed and as actually installed. The resulting Operation & Maintenance information shall be system specific, concise, to the point and tailored specifically to this facility. The CxA shall review these documents as necessary for final corrections by the Contractor.
  - 4. Contractor shall submit Operations & Maintenance Manuals for each piece of equipment for review no later than 45 days after submittal approval.



- B. The Operation & Maintenance Manual review and coordination efforts shall be completed prior to Owner orientation sessions, as these documents are to be utilized in the orientation sessions.
- C. System Operations Manual
  - 1. The CxA shall prepare and deliver these documents with inputs from the Contractor. The Contractor shall provide all required documents to the CxA, through the Commissioner. The required documents shall be described in the Commissioning Plan and Contract Documents. Typically, the manual includes the following:
    - a. System, subsystem, and equipment descriptions
    - b. Commissioned systems single line diagrams (to be provided by Mechanical, Electrical, Plumbing, and Building Management System (BMS) subcontractors).
    - c. As built sequences of operations, control drawings and original set points (to be provided by Design Consultant and BMS subcontractor).
    - d. Operating instructions for integrated building systems (to be provided by Mechanical and BMS subcontractors).
    - e. Recommended schedule of maintenance requirements and frequency (to be provided by subcontractors).
    - f. Recommended schedule for calibrating sensors and actuators (to be provided by BMS subcontractor).

### **3.5 DEMONSTRATION AND INSTRUCTION**

- A. The Contractor shall schedule and coordinate instruction sessions for the facility's staff for each commissioned system. Demonstrations shall be held per Contract Documents, along with the appropriate schematics, handouts and visual / audio orientation aids onsite with equipment.
- B. The equipment vendors shall provide instruction on the specifics of each major equipment item including philosophy, troubleshooting and repair techniques.
- C. The Contractor shall record and edit demonstration and orientation sessions, and provide these records to the CxA, through the Commissioner.
- D. For additional direction pertinent to instruction, refer to other specific divisions for demonstration and instruction requirements.

### **3.6 WARRANTY REVIEW / SEASONAL TESTING**

- A. The CxA will return upon the start of the new season (cooling or heating) after Project completion to conduct performance tests that could not be performed due to ambient conditions. The seasonal testing will only be performed if unsuitable loads / conditions were unavailable during the performance testing stages (in other words; the requirement for testing is warranted).
- B. The CxA will return to the site approximately 10 months into the 12-month warranty period and interview the occupants and maintenance staff, review the operation of the building, provide recommendations for installation and operational problems and document warranty and operational issues in the issues database.

### **3.7 RECORD DRAWINGS**

- A. The CxA shall review the as built Contract Documents to verify incorporation of both design changes and as built construction details. Discrepancies noted shall be corrected by the appropriate party.

**END OF SECTION 01 91 13**



**SECTION 01 91 15  
GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE**

**REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 15**

**PART I – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].
- B. The Owner's Project Requirements (OPR) and Basis of Design (BOD) documents are included by reference for information only.
- C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

**1.2 SECTION INCLUDES**

- A. This section includes the commissioning requirements for the Building Enclosure systems. Refer to "Building Enclosure Functional Performance Test Protocol" in other sections of the Project specifications for specific requirements regarding Building Enclosure Commissioning.
  - 1. The commissioning requirements for the Building Enclosure systems given in this section are entirely separate from, and in addition to, the Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for this Project. The Contractor, and his/her Suppliers, Subcontractors, Vendors, etc., are required to participate in both commissioning processes as required.

**1.3 DESCRIPTION**

- A. Building Enclosure Commissioning (BECx) is a systematic process of ensuring all building enclosure systems responsible for environmental separation perform OPR BOD. The BECx process is intended to verify and document proper installation and performance of building enclosure materials and systems in accordance with the Contract Documents.
- B. Commissioning does not take away from, or reduce the Contractor's responsibility to provide a finished and fully functioning product and installation.
- C. This section shall in no way diminish the responsibility of the Contractor in performing all aspects of work and testing as outlined in the Contract Documents. Any requirements outlined in this section are in addition to requirements outlined in the Contract Drawings and Specifications.

**1.4 RELATED WORK**

- A. Specific BECx requirements are given in this Section. The following Project Specification sections are related to the commissioning work specified in this section:
  - 1. Basic Concrete Requirements: Refer to Division 03
  - 2. Basic Metal Requirements: Refer to Division 05
  - 3. Basic Waterproofing, Roofing, Air Barrier and Insulation Requirements: Refer to Division 07



4. Basic Fenestrations Requirements: Refer to Division 08
5. Basic Finishing Requirements: Refer to Division 09

### 1.5 DEFINITIONS AND ABBREVIATIONS

- A. Refer to Article 2 of the Contract and Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for terms, words, and expressions not otherwise defined herein.
- B. Approval: Acceptance that a material or system has been properly installed and is functioning in tested modes according to the Contract Documents.
- C. Building Enclosure Commissioning Agent (BECA): Consultant under separate contract with the City of New York to provide BECx Services for this Project. BECA directs and coordinates day-to-day BECx commissioning activities.
- D. Building Enclosure Testing Agency (BETA): Building Enclosure Testing Agency whom is an independent agency retained by the Contractor and approved by the Commissioner, fully accredited by the appropriate governing body for each of the materials, components or systems to be tested or evaluated for compliance with requirements of the Contract Documents and as directed by the BECA. Documentation of such certification must be submitted to and approved by the Commissioner prior to the start of any work by the BETA.
- E. Commissioning: Commissioning is a systematic process of ensuring and documenting that the building systems, including the Building Enclosure, have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing Contractors to provide a finished product.
- F. Commissioning Agent (CxA): Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
- G. Commissioning Plan: Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
- H. Deficiency: Condition of a building enclosure material or system that is not in compliance with Contract Documents (that is, does not perform properly or is not complying with design intent).
- I. Design Consultant: Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
- J. Functional Performance Test (FPT): Test of performance of building enclosure materials and systems. Systems are tested under various simulated environmental conditions, such as air leakage under pressure differential and water leakage under pressure differential with water spray.
- K. Simulated Condition: Condition created for testing component or system (e.g., applying pressure differential across the building enclosure concurrent with water spray to simulate a wind driven rain).
- L. Mock-up: The activities where systems or materials are initially constructed and tested.



## 1.6 COORDINATION

- A. Building Enclosure Commissioning Team: Members of the Building Enclosure Commissioning Team shall consist of:
1. CxA
  2. BECA
  3. BETA
  4. Commissioner
  5. Contractor, and all Building Enclosure Subcontractors
  6. Design Consultant
- B. Management: City of New York shall contract services of the BECA through a separate contract. The BECA shall direct and coordinate commissioning activities and report to the Commissioner. All members of the Building Enclosure Commissioning Team shall cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.
- C. Scheduling: BECA shall work with Building Enclosure Commissioning Team to establish required commissioning activities to incorporate in preliminary commissioning schedule. The Contractor shall integrate commissioning activities into master construction schedule, in accordance with Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION. Necessary notifications are to be made in a timely manner in order to expedite commissioning.

## 1.7 SUBMITTALS

- A. Contractor shall provide documentation required for commissioning work in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. At minimum, documentation shall include but not be limited to:
1. Submittal of shop drawings, product data, samples, etc., relevant to BECx and as requested by the BECA. Such submittals shall be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
  2. As-Built Record Drawings and Operation and Maintenance Information relevant to BECx and as required by the BECA. Such submittals shall be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
  3. All demonstration and orientation submittals relevant to BECx and as requested by the BECA. Such submittals shall be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.
  4. Performance data, any performance test procedures, and installation and checkout materials.
- B. The Contractor shall provide all submittals to the Design Consultant, as per Section 01 33 00 SUBMITTAL PROCEDURES. The Design Consultant will transmit all building enclosure related submittals to the BECA for concurrent review.

**PART II – PRODUCTS** – Part not used.

**PART III – EXECUTION**

### 3.1 SYSTEMS TO BE COMMISSIONED

- A. Building Enclosure systems to be commissioned may include, but are not limited to, Below Grade Waterproofing Systems, Opaque Wall/Cladding Systems, and Fenestration systems. Refer to the Contract Documents for clarity.



### 3.2 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS DURING CONSTRUCTION PHASE

- A. Responsibilities of the Design Consultant include without limitation the following:
1. Review BECA comments on construction document and shop drawings.
  2. Assist in dispute resolution regarding building enclosure items.
  3. Review BECA reports.
  4. Incorporate BECA Submittal Review Comments into response on Submittals.
- B. Responsibilities of the BECA include the following without limitation, as needed per the Contract Documents:
1. Review and comment on mock-up construction and testing plan as provided by Contractor.
  2. Development of BECx Plan.
  3. Review of building enclosure shop drawings and submittals, including "approved equal" requests, through the Commissioner in accordance with Section 01 33 00 Submittal Procedures.
  4. Attend combined Pre-construction and BECx kick-off meeting.
  5. Develop construction checklists for the building enclosure for the Contractor's use.
  6. Observe the construction of a building enclosure mock-up.
  7. Witness the testing of a building enclosure mock-up.
  8. Project meetings / conference calls / Coordination.
  9. Field monitor installation of exterior enclosure components.
  10. Update field report log.
  11. Update BECx Plan.
  12. Advise on Requests For Information.
  13. Assist with the preparation of LEED paperwork.
  14. Prepare Systems Manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
  15. Complete Maintenance Plan, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
  16. Prepare Training Manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
  17. Prepare final BECx record and enclosure commissioning close-out documents.
  18. Develop on-going BECx Plan.
- C. Responsibilities of the Contractor and Building Enclosure Subcontractors include without limitation the following:
1. Review BECx Plan and FPT specification.
  2. Attend commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
  3. Incorporate commissioning activities into the construction schedule.
  4. Periodically update commissioning activities in the construction schedule.
  5. Notify Commissioner and BECA of work completion.
  6. Verify building enclosure materials and assemblies are ready for functional testing.
  7. Retain the services of an approved independent BETA; submit qualifications of independent BETA to Commissioner for approval; coordinate all activities and deliverables of this BETA; ensure all BETA deliverables are provided to the Building Enclosure Commissioning Team.
  8. Attend all required material and systems testing.
  9. Execute all periodic maintenance or repairs required on started systems from initial mock-up of equipment to final acceptance by Commissioner to prevent material warranties from being voided.



10. Submit maintenance logs of all interim maintenance or repair tasks performed by Contractor.
11. Ensure installation work is complete, is in compliance with Contract Documents, and is ready for Functional Performance Testing. FPT test results shall be documented by BECA.
12. Ensure resolution of non-compliance and deficiencies in construction or test results. Obtain written documentation of completion from the appropriate Contractors.
13. Provide letters of compatibility for adjacent building enclosure materials and assemblies.
14. Facilitate all repairs and retesting of failed condition at no additional cost to the City of New York.
15. Provide all warranty information to BECA.

D. Responsibilities of the BETA include without limitation the following:

1. Attend commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
2. Provide on-site technician and equipment to complete mock-up and field Functional Performance Testing.
3. Prepare and submit reports to the Commissioner at the conclusion of all testing.
4. Perform retesting and prepare corresponding reports.

### **3.3 BUILDING ENCLOSURE COMMISSIONING TEAM (BECx) MEETINGS**

- A. BECx meetings shall be held periodically as determined by the Commissioner and recommended by BECA.
- B. Discussions held in BECx meetings shall include, but not be limited to, system/materials, mock-up/field, progress, scheduling, testing, documentation, deficiencies, and problem resolution.
- C. The Contractor shall attend BECx meetings, and shall ensure the attendance of required subcontractors, as requested.

### **3.4 REPORTING**

- A. BECA shall provide status reports to the Commissioner. The Commissioner will provide such status reports to the Contractor, CxA, Design Consultant, and other entities as needed.
- B. BECA shall submit non-compliance and deficiency reports to Commissioner. The Commissioner shall provide such reports to the Contractor, CxA, Design Consultant, and other entities as needed.
- C. BECA shall provide a final summary report to Commissioner and CxA.

### **3.5 MOCK-UP AND FINAL CONSTRUCTION**

- A. Contractor shall verify completion of all assemblies compliant with Contract Documents and deficiency log items prior to Functional Performance Testing or concealment of functional performance layers within the building enclosure.

### **3.6 FUNCTIONAL PERFORMANCE TESTING**

A. Objectives and Scope

1. The objective of Functional Performance Testing is to demonstrate that the building enclosure is performing according to documented design intent and Contract Documents. Functional Performance Testing facilitates bringing the building enclosure systems from a state of substantial completion to fully operational. Additionally, during Functional Performance Testing, areas of deficient performance are identified and corrected, improving building enclosure system performance.



**B. Development of Test Procedures**

1. The purpose of a specific test is to verify and document compliance of the installed enclosure systems with the OPR. Building Enclosure Functional Performance Test Protocols are provided in other sections of the Project Specifications for specific requirements regarding BECx.

**C. Coordination and Scheduling**

1. Contractor shall provide sufficient notice to BECA, through the Commissioner, regarding completion schedule for materials and systems. Testing to be performed in conjunction with site visits. Contractor shall schedule Functional Performance Tests with Commissioning Team. BECA shall witness and document functional testing of equipment and systems. BETA, as retained by the Contractor, shall execute tests under direction of BECA.
2. Successful completion of mock-up functional performance testing shall occur prior to full production installation of building enclosure materials and systems.

**3.7 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS**

**A. Documentation**

1. BECA shall witness and document results of FPT.

**B. Non-Conformance**

1. BECA shall record results of functional testing. Deficiency or non-conformance issues shall be noted and reported to the Commissioner. The Commissioner shall provide such non-conformance reports to the CxA, Design Consultant, Contractor, and other entities, as needed.
2. Corrections of minor deficiencies identified may be made during tests at discretion of the Commissioner and recommended by the BECA. In such cases, deficiency and resolution shall be documented.
3. Every effort shall be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests.
4. Deficiencies are handled in the following manner:
  - a) BECA documents deficiencies and notes Contractors response and intentions. Finding a deficiency shall not end the testing process.
  - b) BECA submits deficiency report to the Commissioner. The Commissioner shall provide such deficiency report to the CxA, Contractor, Design Consultant, and other entities as required.
  - c) Contractor corrects deficiency and certifies that material or assembly is ready to be retested.
  - d) Contractor informs Commissioner of retesting schedule for coordination with the BECA.
  - e) Contractor reschedules test with the Commissioner and BETA at no additional cost to the City of New York.

**C. Testing**

1. Costs for all testing and retesting required for the Project shall be the responsibility of the Contractor. The Contractor is to provide access to the test specimens to the Commissioning Team, through the Commissioner.



### **3.8 COMMISSIONING DOCUMENTATION**

#### **A. Final Report Details**

1. Final BECx Report shall include an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope, and general description of testing and verification methods. Report shall contain evaluation regarding:
  - a) Conformance to specifications and design intent
  - b) Material/system installation
  - c) Functional performance
2. All outstanding non-compliance items shall be specifically listed.
3. Recommendations for improvement to system or operations, future actions, etc. shall also be listed.

**END OF SECTION 01 91 15**



**Department of  
Design and  
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS  
SINGLE CONTRACT PROJECTS  
Issue Date: July 1, 2019

(No Text on This Page)





Department of Design and Construction

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

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

Contract for Furnishing all Labor and Material Necessary

Contractor

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

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

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

Entered in the Comptroller's Office

First Assistant Bookkeeper

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





FMS ID: S136-383S



Department of Design and Construction

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

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

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

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

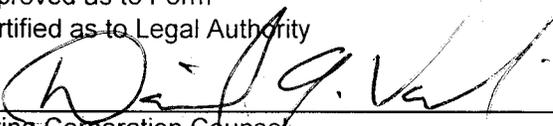
**DSNY SI District 3 Garage 7 Repair  
Shop HVAC System & Roof  
Replacement**

LOCATION: 1000 West Service Road  
BOROUGH: Staten island, NY 10314  
CITY OF NEW YORK

Contractor

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

Approved as to Form  
Certified as to Legal Authority

  
Acting Corporation Counsel

Dated September 18, 2019

Entered in the Comptroller's Office

First Assistant Bookkeeper

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

9/18/19  
AC





Department of  
Design and  
Construction

PROJECT ID:

S136-383S

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:

**DSNY District S13 Garage and Repair  
Shop – HVAC System and Roof  
Replacement**

LOCATION:  
BOROUGH:  
CITY OF NEW YORK

1000 West Service Road  
Staten Island, NY 10314

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

New York City Department of Sanitation

WSP USA Inc.

Date: June 28, 2019



20-003





**Department of  
Design and  
Construction**

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

**ADDENDUM TO THE GENERAL CONDITIONS  
FOR SINGLE CONTRACT PROJECTS**

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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 #:** S136-383S

**PROJECT NAME:** DSNY District SI3 Garage and Repair Shop – HVAC System and Roof Replacement

**PROJECT DESCRIPTION:** This project consists of a roof and HVAC system replacement at the DSNY SI3 garage. As a result of the HVAC upgrades a new electrical service will be required and installed, accompanied by a new photovoltaic system at the roof to be integrated into the primary electrical system.

**PROJECT LOCATION:** 1000 West Service Road  
**BOROUGH:** Staten Island  
**CITY OF NEW YORK**  
**ZIP CODE:** 10314  
**COMMUNITY BOARD #:** 3

**LANDMARK STATUS:**

**DESIGNATED LANDMARK STRUCTURE OR SITE: NO**  
*If this is a Designated Landmark Structure or Site, Section 01 3591, Historic Treatment Procedures applies to this project.*

**LANDMARK QUALITY STRUCTURE: NO**  
*If this is a Landmark Quality Structure, Section 01 3591, Historic Treatment Procedures applies to this project.*

## II. LEED GREEN BUILDING REQUIREMENTS

NOT USED

## III. COMMISSIONING REQUIREMENTS

NOT USED

## 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>	Applies	Does not Apply	Applies as Amended
01 1000	1.4 (B)	Scope and Intent / LEED		X	
	1.4(C)	Scope and Intent / Commissioning		X	
01 3233		Photographic Documentation	X		
01 3300	1.7 (A-D)	LEED Submittals		X	
01 3503		General Mechanical Requirements	X		
01 3506	3.2 (A-B)	Electrical Conduit System Including Boxes (Pull, Junction and Outlet)	X		
	3.3 (A-E)	Electrical Wiring Devices	X		
	3.4 (A-I)	Electrical Conductors and Terminations	X		
	3.5 (A-B)	Circuit Protective Devices	X		
	3.6 (A-J)	Distribution Centers	X		
	3.7 (A-I)	Motors	X		
	3.8 (A-I)	Motor Control Equipment	X		
01 3591		Historic Treatment Procedures		X	
01 5000	3.2 (A)	Temporary Water Facilities / Temporary Water		X	
	3.2 (B)	Temporary Water Facilities / Temporary Water – Work in Existing Facilities	X		
	3.3 (B)	Temporary Sanitary Facilities / Self-Contained Toilet Units		X	
	3.3 (C)	Temporary Sanitary Facilities / Existing Toilets	X		
	3.4 (B) 1	Temporary Power, Lighting, and Site Lighting / Connection to Utility Lines	X		

<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	3.4 (B) 2	Temporary Power, Lighting, and Site Lighting / Connection to Existing Electrical Power Service	X		
	3.4 (B) 3	Temporary Power, Lighting, and Site Lighting / Electrical Generator Power Service		X	
	3.4 (D)	Temporary Power, Lighting, and Site Lighting / Temporary Lighting		X	
	3.4 (E)	Temporary Power, Lighting, and Site Lighting / Site Security Lighting (for New Construction Only)		X	
	3.5 (A-J)	Temporary Heat	X		
	3.8 (A)	DDC Field Office / Office Space in Existing Building	X		
	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.

### ADDITIONAL SECTIONS/SUB-SECTIONS

The Contractor is advised that the additional Sub-Sections set forth below are included in the General Conditions and apply to the Project.

#### **Contractor Limitations to site access & construction Conditions:**

The Contractor's hours of operation during construction on the Administration/Locker room portion of the building is from 3:00pm – 12:00am.

Contractor to provide temporary protection, roof deck, vapor barrier, lighting, dust protection and all necessary items to ensure that locker room in the Administration is operation during the daytime hours 4:00am – 2:00pm.

Contractor to provide dust mitigation and protection during all phases of construction.

#### **Phasing:**

1. The facility will be occupied during construction.
2. Work at the facility shall be phased so that the facility is operational and accessible at all times with no interruption to service while replacements are under construction. The sequence the work in phases per building area as shown on the contract drawing plan drawing.
3. The Contractor shall submit a construction phasing plan for approval by the Commissioner before the commencement of work.
4. The Contractor shall coordinate the Contractor's phasing plan with the Commissioner and Building Management to maintain continuous facility operation.
5. Contractor shall provide all necessary safety barriers, enclosures, fire watch, etc. and as further stipulated in the Contract between the City and the Contractor and the General Conditions to the Contract.
6. The contractor shall be responsible to maintain the operation of the building, including providing necessary repairs, at all times for a 24 hour period during construction activities. In addition, upon completion of each phase, the contractor will be responsible for interim maintenance until Substantial Completion.
7. Contractor shall not perform work in the event any snow removals operation by DSNY. The commissioner will be the sole determiner if work is able to take place on site in the event of snow.

### VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

Refer to page 3 of the Bid Booklet in Volume 1 for Special Experience Requirements.

### IX. REVISIONS: SPECIFICATIONS AND CONTRACT DRAWINGS

The Specifications and the Contract Drawings for the Project are revised in accordance with the provisions set forth below.

- (1) Owner: Wherever the term "Owner" is used in the Specifications and/or the Contract Drawings, such term shall mean the City of New York.
- (2) Other Entities: In the event any entity other than the City of New York is referred to or named as the "Owner" in the Specifications and/or the Contract Drawings, the name of such other entity is deemed deleted and replaced with the "City of New York".
- (3) Architect / Engineer: Wherever the words "Architect", "Engineer", "Architect / Engineer" or "Architect and/or Engineer" are used in the Specifications and/or the Contract Drawings, such words are deemed deleted and replaced with the word "Commissioner".
- (4) Products / Manufacturers: Wherever the Specifications and/or the Contract Drawings require the contractor to provide a particular product (i.e., material and/or equipment) from a designated manufacturer and/or vendor, the term "or approved equal" is deemed inserted, even if only one product and/or manufacturer is specified, except as otherwise provided below.
  - (a) Proprietary Items: If the 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)**  
**PART I - Contract Requirements**

Various Articles of the Contract refer to requirements which are set forth in Schedule A of the General Conditions. The Schedule set forth below specifies the following: (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the contract.

REFERENCE	ITEM	REQUIREMENTS	CONTRACT #1
Information For Bidders	Bid Security		See Attachment 1 – Bid Information in the Bid Booklet
Information For Bidders	Performance and Payment Bonds		See Attachment 1- Bid Information in the Bid Booklet
Article 14 Contract	Time of Substantial Completion	Consecutive Calendar Days	365 CCD
Article 15 Contract	Liquidated Damages	For each consecutive calendar day over completion time	\$400
Article 17 Contract	Sub-Contracts	Not to exceed Percent of Contract Price	<b>60%</b>
Article 21 Contract	Retainage	Percent of Voucher	If 100% bonds are required <b>5%</b> If 100% bonds are not required, and Contract Price is \$1,000,000 or less <b>5%</b> If 100% bonds are not required, and Contract Price is more than \$1,000,000 <b>10%</b>
Article 24 Contract	Deposit Guarantee	Percent of Contract Price	<b>1%</b>
Article 24 Contract	Period of Guarantee		See Schedule B of the Addendum to the General Conditions
Article 74 Contract	Statement of Work		Addenda, numbered: _____
Article 75 Contract	Compensation to be Paid to Contractor		Amount for which the Contract was Awarded: _____ Dollars (\$ _____)
Article 79 Contract	MWBE Program		See MWBE 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, NYPL, 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> </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] Art. 22.1.8</p> <p>■ Asbestos Liability _____</p>	<p>Only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>\$1,000,000 each occurrence, \$2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and consultants.</p>
<p>[OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Boiler Insurance _____</p>	<p>\$200,000</p>
<p>[OTHER] Art. 22.1.8</p> <p>■ Professional Liability</p> <p>In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.</p>	<p>\$1,000,000 per occurrence</p> <p>The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of \$1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer.</p> <p>Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.</p>

**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

---

30-30 Thomson Avenue, 4<sup>th</sup> Floor

---

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
075216	Modified Bituminous Membrane Roofing	20 years
076200	Sheet Metal Flashing & Trim (Finish)	25 years
077100	Roof Specialties (Finish)	20 years
079200	Joint Sealants	20 years
086400	Skylights	10 years
087100	Door Hardware	3 years
210750	Electric Heat Trace for Fire Protection Systems	10 years
220533	Heat Tracing for Plumbing Piping	10 years
230513	Electric Motors	1 year
230923	Building Management and Control System	1 year
235235	Packaged Water Tube Boilers	20 years
235510	Refrigeration Machines (Air Cooled)	1 year
236220	Rooftop Package Heating and Cooling Units	1 year
237300	Factory Assembled Air Handling Units	1 year
237305	Fans	1 year
238500	Variable Frequency Controllers	1 year

238600	Electric Motor Controllers	5 years
262416	Panelboards	1 year
262726	Wiring Devices	5 years
262919	Switchboards	5 years
263100	Solar Photovoltaic Systems - Modules	20 years
263100	Solar Photovoltaic Systems - Inverters	10 years
265000	Luminaires and Accessories – LED Fixtures	5 years
265000	Luminaires and Accessories – Control Devices	5 years
265000	Luminaires and Accessories – Software	1 year
283100	Fire Alarm Life Safety System	2 years

(3) **Application:** The obligations under the warranty for the periods specified above shall apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

(4) **Other Provisions:** The warranty requirements set forth in this Schedule B are also included in the Specifications.

- (a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B shall take precedence.
- (b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, shall remain in full force and effect
- (c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.
- (d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor shall be obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.
- (e) Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.

**SCHEDULE C**

**Contract Drawings**

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

**ASBESTOS DRAWINGS**

H-001.00 ASBESTOS ABATEMENT GENERAL NOTES  
H-002.00 ASBESTOS ABATEMENT ROOF PARTIAL PLAN - NORTH  
H-003.00 ASBESTOS ABATEMENT ROOF PLAN - MIDDLE  
H-004.00 ASBESTOS ABATEMENT ROOF PLAN - BULKHEAD  
H-005.00 ASBESTOS ABATEMENT ROOF PARTIAL PLAN - SOUTH

**ARCHITECTURAL DRAWINGS**

GN-101.00 GENERAL NOTES  
GN-102.00 PHASING PLAN  
DM-101.00 ROOF REMOVALS PLAN  
A-100.00 SITE PLAN & SITE DETAILS  
A-101.00 ROOF PLAN  
A-102.00 FIRST FLOOR PART PLANS & RCP  
A-103.00 SECOND FLOOR PART PLANS & RCP  
A-104.00 FIRST FLOOR & SECOND FLOOR REFLECTED CEILING PLANS  
A-201.00 ELEVATIONS  
A-501.00 ROOF REMOVALS DETAILS 1  
A-502.00 ROOF DETAILS 1  
A-503.00 ROOF DETAILS 2  
A-901.00 LOUVER AND DOOR SCHEDULES & DETAILS

**STRUCTURAL DRAWINGS**

S-001.00 GENERAL NOTES, TYPICAL DETAILS  
S-100.00 EXISTING ROOF DEFICIENCY AND REPAIR PLAN  
S-101.00 ROOF FRAMING PLAN - POST UP LOCATIONS FOR NEW DUNNAGE  
AND NEW ROOF OPENINGS. 1ST FLOOR PART PLAN  
S-102.00 ROOF DUNNAGE  
S-103.00 SECTIONS

**ENERGY CODE COMPLIANCE DRAWINGS**

EN-001.00 MECHANICAL ENERGY CODE COMPLIANCE SHEET 1  
EN-002.00 MECHANICAL ENERGY CODE COMPLIANCE SHEET 2  
EN-003.00 ELECTRICAL ENERGY CODE COMPLIANCE

**MECHANICAL DRAWINGS**

M-001.00 MECHANICAL DRAWING LIST, SCOPE OF WORK AND NOTES  
M-002.00 MECHANICAL LEGEND AND ABBREVIATIONS  
M-100.00 MECHANICAL FIRST FLOOR PLAN - DEMOLITION  
M-101.00 MECHANICAL BOILER ROOM AND FIRST FLOOR PART PLANS - DEMOLITION  
M-102.00 MECHANICAL ROOF PLAN - DEMOLITION  
M-200.00 MECHANICAL FIRST FLOOR PLAN - NEW CONSTRUCTION  
M-201.00 MECHANICAL BOILER ROOM AND FIRST FLOOR PART PLANS - NEW  
CONSTRUCTION

M-202.00 MECHANICAL ROOF -NEW CONSTRUCTION  
M-500.00 MECHANICAL AIR RISER DIAGRAM  
M-501.00 MECHANICAL WATER RISER DIAGRAM  
M-600.00 MECHANICAL DETAILS SHEET 1  
M-601.00 MECHANICAL DETAILS SHEET 2  
M-602.00 MECHANICAL DETAILS SHEET 3  
M-603.00 MECHANICAL DETAILS SHEET 4  
M-604.00 MECHANICAL DETAILS SHEET 5  
M-605.00 MECHANICAL DETAILS SHEET 6  
M-606.00 MECHANICAL DETAILS SHEET 7  
M-700.00 MECHANICAL SCHEDULES  
M-800.00 MECHANICAL CONTROLS SHEET 1  
M-801.00 MECHANICAL CONTROLS SHEET 2  
M-802.00 MECHANICAL CONTROLS SHEET 3 - BMS ARCHITECTURE  
M-803.00 MECHANICAL CONTROLS SHEET 4  
M-804.00 MECHANICAL CONTROLS SHEET 5  
M-805.00 MECHANICAL CONTROLS SHEET 6  
M-806.00 MECHANICAL CONTROLS SHEET 7

**ELECTRICAL DRAWINGS**

E-001.00 ELECTRICAL LEGEND, SYMBOLS & ABBREVIATIONS  
E-002.00 ELECTRICAL DETAILS SHEET #1  
E-003.00 ELECTRICAL DETAILS SHEET #2  
E-010.00 ELECTRICAL SITEWORK PLAN  
E-011.00 ELECTRICAL SITEWORK DETAIL AND SECTIONS  
E-101.00 ELECTRICAL DEMO PLAN - FIRST FLOOR  
E-102.00 ELECTRICAL DEMO PARTIAL PLANS - FIRST & SECOND FLOORS  
E-103.00 ELECTRICAL DEMO PLAN - ROOF  
E-201.00 ELECTRICAL NEW WORK PLAN - FIRST FLOOR  
E-202.00 ELECTRICAL NEW WORK PARTIAL PLANS - FIRST AND SECOND FLOORS  
E-203.00 ELECTRICAL NEW WORK PLAN - ROOF  
E-301.00 GROUNDING PLAN - FIRST FLOOR  
E-302.00 LIGHTNING PROTECTION PLAN - ROOF  
E-401.00 PHOTOVOLTAIC SYSTEM PLAN - ROOF  
E-500.00 ELECTRICAL RISER DIAGRAM EXISTING CONDITIONS  
E-501.00 ELECTRICAL RISER DIAGRAM CONSTRUCTION SEQUENCE 1  
E-502.00 ELECTRICAL RISER DIAGRAM CONSTRUCTION SEQUENCE 2  
E-503.00 ELECTRICAL RISER DIAGRAM FINAL CONDITIONS  
E-510.00 PHOTOVOLTAIC SINGLE LINE DIAGRAM  
E-601.00 ELECTRICAL SCHEDULES SHEET #1  
E-602.00 ELECTRICAL SCHEDULES SHEET #2  
E-701.00 ELECTRICAL SEQUENCING PLAN FIRST FLOOR ELECTRICAL SERVICE ROOM

**FIRE ALARM DRAWINGS**

FA-001.00 FIRE ALARM SYMBOLS, NOTES & ABBREVIATIONS  
FA-101.00 FIRE ALARM DEMO WORK PLAN - FIRST FLOOR  
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**PLUMBING DRAWINGS**

P-001.00 PLUMBING COVER SHEET  
P-100.00 PLUMBING FIRST FLOOR PLAN - DEMOLITION  
P-110.00 PLUMBING ROOF PLAN - DEMOLITION  
P-200.00 PLUMBING FIRST FLOOR PLAN - NEW CONSTRUCTION  
P-210.00 PLUMBING ROOF PLAN - NEW CONSTRUCTION  
P-300.00 PLUMBING RISER DIAGRAMS  
P-500.00 PLUMBING DETAILS

**FIRE PROTECTION DRAWINGS**

FP-001.00 FIRE PROTECTION COVER SHEET  
FP-100.00 FIRE PROTECTION FIRST FLOOR PLAN - DEMOLITION (OVERALL)  
FP-110.00 FIRE PROTECTION ROOF PLAN - DEMOLITION (OVERALL)  
FP-200.00 FIRE PROTECTION FIRST FLOOR PLAN - NEW CONSTRUCTION (OVERALL)  
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FP-220.00 PARTIAL 1ST & 2ND FLOOR FIRE PROTECTION PLAN - NEW  
CONSTRUCTION  
FP-300.00 FIRE PROTECTION RISER DIAGRAM  
FP-400.00 FIRE PROTECTION SCHEDULES & HYD FLOW DATA  
FP-500.00 FIRE PROTECTION DETAILS

**SCHEDULE D**

**Electrical Motor Control Equipment**

**(Reference: 01 3506, Article 3.8 of the DDC Standard General Conditions)**

Requirements for electrical motor equipment may be included in one or more sections of the Specifications for the Contract for the Project. Schedule D set forth below delineates specific information for electrical motor control equipment. In the event of any conflict between the Specifications and this Schedule D, Schedule D shall take precedence; provided, however, in the event of an omission from Schedule D (i.e., Schedule D omits either a reference to or information concerning electrical motor equipment which is set forth in the Specifications), such omission from Schedule D shall have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, shall remain in full force and effect.

**DB** Disconnect Circuit Breaker (Switch)    **P** Pilot Light    **BG** Break Glass Station  
**TS** Thermal Switch    **F** Firestat    **HOA** Hand-Off Auto.  
**MS** Magnetic Starter    **T** Thermostat    **PB** Push Button Station  
**CMS** Comb. Mag. Starter    **AL** Alternator    **RO** Remote "off"

Equip. Ident.	Location	# of Units	HP or KW	Volts and Phase	Control Type: See legend above	Remarks:
HWP-4	MER	1	10	208/3	CMS	
HWP-5	MER	1	10	208/3	CMS	
CHWP-1	MER	1	5	208/3	CMS	
FPP-1	ROOF	1	.25	120/1	CMS	
FPP-2	ROOF	1	.25	120/1	CMS	
FPP-3	ROOF	1	.25	120/1	CMS	
FPP-4	ROOF	1	.25	120/1	CMS	
HV-1	1 <sup>st</sup> floor	1	1	208/3	CMS	
HV-2	1 <sup>st</sup> floor	1	1.5	208/3	CMS	
HV-3	1 <sup>st</sup> floor	1	1	208/3	CMS	
MU-1	ROOF	1	10	208/3	CMS	
MU-2	ROOF	1	20	208/3	CMS	
MU-3	ROOF	1	10	208/3	CMS	
MU4	ROOF	1	20	208/3	CMS	
CH-1	ROOF	1	51	208/3	CMS	
GMU-1	MER	1	1	208/3	CMS	
GMU-2	MER	1	1	208/3	CMS	
EF-1	ROOF	1	1.5	208/3	CMS	
EF-2	ROOF	1	1.5	208/3	CMS	
EF-3	ROOF	1	1.5	208/3	CMS	

EF-4	ROOF	1	1.5	208/3	CMS	
EF-5	ROOF	1	.25	115/1	CMS	
EF-6	ROOF	1	1	208/3	CMS	
EF-7	ROOF	1	.5	208/3	CMS	
EF-8	ROOF	1	1	208/3	CMS	
EF-9	ROOF	1	1.5	208/3	CMS	
EF-10	ROOF	1	1.5	208/3	CMS	
EF-11	ROOF	1	1.5	208/3	CMS	
EF-12	ROOF	1	1.5	208/3	CMS	
EF-13	ROOF	1	1.5	208/3	CMS	
EF-14	ROOF	1	1.5	208/3	CMS	
EF-15	ROOF	1	1	208/3	CMS	
EF-16	ROOF	1	5	208/3	CMS	
EF-17	ROOF	1	5	208/3	CMS	
EF-18	ROOF	1	3	208/3	CMS	
EF-19	ROOF	1	.1	115/1	CMS	
TP-1	GARAGE	1	7.5	208/3	CMS	
TP-2	GARAGE	1	7.5	208/3	CMS	
WE-1	ROOF	1	1	208/3	CMS	
TP-3	GARAGE	1	2	208/3	CMS	
TE-1	ROOF	1	.1	115/1	CMS	
TE-2	ROOF	1	.1	115/1	CMS	
TE-3	ROOF	1	.1	115/1	CMS	
TE-5	ROOF	1	.1	208/1	CMS	
EF-20	ROOF	1	1.5	208/3	CMS	
CAF-1	MER	1	.5	115/1	CMS	
PE-1	ROOF	1	.1	208/1	CMS	
PE-2	ROOF	1	.1	208/1	CMS	
ERF-1	ELEC RM	1	.1	208/3	CMS	
ERU-1	ROOF	1	92	208/3	CMS	
ERU-2	ROOF	1	92	208/3	CMS	
ERU-3	ROOF	1	92	208/3	CMS	
ERU-4	ROOF	1	19	208/3	CMS	
RTU-1	ROOF	1	60	208/3	CMS	
UH-1,2,3	BORO REP	3	.5	115/1	CMS	
UH-4	BORO REP	1	.1	115/1	CMS	
UH-5	BORO REPAIR	1	.5	115/1	CMS	
UH-6,7,8	BORO REPAIR	3	.33	115/1	CMS	
UH-9 TO 18	BORO REPAIR	10	.33	115/1	CMS	

**SCHEDULE E**

**Separation of Trades**

***NOT USED FOR SINGLE CONTRACTS***

















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**CONTRACT # 1**  
**GENERAL CONSTRUCTION WORK**

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**SECTION 02 41 91  
SELECTIVE DEMOLITION, REMOVALS, AND SALVAGE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) 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 all labor, materials, equipment, and services necessary to complete the work of selective demolition, removals, and salvage as shown on the Drawings, specified herein, and as required by conditions and NYC Department of Buildings, including, but not limited to, the following:
1. Demolition and removal of selected portions of buildings or structures.
  2. Repair procedures for selective demolition operations.

**1.3 DEFINITIONS**

- A. Selective Demolition: Carefully demolish existing construction and legally dispose of removed elements and materials off-site.
- B. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- C. Remove and Salvage: Detach items from existing construction and store them for restoration and reinstallation.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.4 MATERIALS OWNERSHIP**

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain City of New York's property, demolished materials shall become Contractor's property and shall be removed from Project site.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Regulatory Requirements: Comply with NYC Department of Environmental Protection regulations before beginning selective demolition, removals, and salvage. Comply with hauling and disposal regulations of NYC Department of Buildings.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.

#### 1.6 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. General: Submit each item in this Article in compliance with the Conditions of the Contract and DDC General Conditions. Revise and resubmit each item as required to obtain Commissioner's approval.
- C. Schedule of Selective Demolition Activities: Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged. Note location of each item or material.
- E. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- F. Utility Mark-Outs: Provide mark-outs for all utilities prior to the start of any work that may impact concealed utilities. Concealed utilities include, but are not limited to, any utilities that may be concealed within roofing, walls, foundations, floors or below grade.

#### 1.7 PROJECT CONDITIONS

- A. Maintain access to existing walkways, areaways, courtyards, and other adjacent used facilities.
  - 1. Do not close or obstruct walkways or other used facilities without written permission from NYC Department of Buildings and NYC Department of Transportation.
- B. City of New York assumes no responsibility for condition of areas to be selectively demolished.
  - 1. Conditions existing at time of inspection for bidding purpose will be maintained by City of New York as far as practical.
- C. Hazardous Materials: the existing building shall be surveyed for potential hazardous materials.
  - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- D. Storage or sale of removed items or materials on-site will not be permitted.



- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

## PART 2 - PRODUCTS

### 2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
  - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to fullest extent possible.
  - 2. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. Inventory and record conditions of items to be removed and reinstalled and items to be removed and salvaged.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit a written report to Commissioner.
- D. As the Work progresses, Contractor licensed in the State of New York shall be responsible to perform any surveys to detect hazards resulting from selective demolition, removals, and storage activities.

### 3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Commissioner and the City of New York. Provide temporary services during interruptions to existing utilities, as acceptable to Commissioner and to the City of New York.

### 3.3 PREPARATION



- A. **Site Access and Temporary Controls:** Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Commissioner, NYC Department of Buildings, and NYC Department of Transportation. Provide alternate routes around closed or obstructed traffic ways.
  - 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by NYC Department of Buildings.
  - 3. Protect existing site improvements, appurtenances, and landscaping to remain.
  
- B. **Temporary Facilities:** Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  
- C. **Temporary Enclosures:** Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  
- D. **Temporary Shoring:** Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being selectively demolished or removed.
  - 1. Strengthen or add new supports when required during progress of selective demolition, removals, and salvage.

### **3.4 POLLUTION CONTROLS**

- A. **Dust Control:** Use temporary enclosures and other suitable methods to limit spread of dust and dirt. Comply with NYC Department of Environmental Protection regulations.



- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition, removals, and salvage operations. Return adjacent areas to condition existing before work of this Section began.

### **3.5 SELECTIVE DISASSEMBLY, REMOVALS, AND SALVAGE**

- A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of NYC Department of Environmental Protection regulations and as follows:
  - 1. Proceed with selective demolition, removals, and salvage systematically, from higher to lower level. Complete operations above each floor or tier before disturbing supporting members on next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches or open flames of any kind during selective demolition, removals, and salvage work.
  - 5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - 7. Locate selective demolition, removals, and salvage equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - 8. Dispose of demolished and removed items and materials promptly.
  - 9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition, removals, and salvage operations began.



- B. Existing Facilities: Protect stairs, walkways, building entries, and other building facilities during selective demolition, removal, and salvage operations.
- C. Removed and Salvaged Items: Comply with the following:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to entity designated to restore and reinstall items.
  - 4. Protect items from damage during transport and storage.
  - 5. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition, removals, and salvage.
- E. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

### **3.6 PATCHING AND REPAIRS**

- A. General: Promptly repair damage to adjacent construction caused by selective demolition, removals, and salvage operations.

### **3.7 DISPOSAL OF DEMOLISHED AND REMOVED MATERIALS**

- A. General: Promptly dispose of demolished and removed materials not to be salvaged. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off City of New York's property and legally dispose of them.

**END OF SECTION**



**SECTION 028013 – GENERAL CONTRACTOR WORK  
NOVEMBER 2017 VERSION**

**ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT**

**1.01 SCOPE FOR ASBESTOS ABATEMENT WORK**

- A. The "General Conditions" apply to the work of this Section.
- B. The asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **\$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.
- C. All work shall be done in accordance with the applicable provisions of the rules and regulations of the asbestos control program as promulgated by Title 15 Chapter I of RCNY and New York State Department of Labor Industrial Code Rule 56 cited as 12 NYCRR Part 56, whichever is more stringent as per latest amendments to these laws and as modified herein by these specifications.
- D. All disposal of asbestos contaminated material shall be per Local Law 70/85.
- E. The asbestos abatement contractor's attention is directed to the fact that certain methods of asbestos abatement are protected by patents. To date, patents have been issued with respect to "negative pressure enclosure" or "negative-air" or "reduced pressure" and "glove bag".
- F. The asbestos abatement contractor shall be solely responsible for and shall hold the Department of Design and Construction and the City harmless from any and all damages, losses and expenses resulting from any infringement by the asbestos abatement contractor of any patent, including but not limited to the patents described above, used by the asbestos abatement contractor during performance of this agreement.
- G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.
- H. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the Work as required by these Specifications. The asbestos abatement contractor is responsible to prepare and submit all filings, notifications, etc. required by all City, State and Federal regulatory agencies having jurisdiction.



The asbestos abatement contractor is responsible for submitting the Asbestos Project Notification Form (ACP-7 Form) to the Department of Environmental Protection, Asbestos Control Program, as per Title 15, Chapter I of RCNY and to the NYSDOL as per Industrial Code Rule 56.

The asbestos abatement contractor is responsible for preparing, and submitting Asbestos Variance Application (ACP-9). If a Variance is required, the asbestos abatement contractor is responsible to retain a NYSDOL Asbestos Project Designer, as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required variance.

The general contractor is responsible for preparing and submitting an Asbestos Abatement Permit and/or Work Place Safety Plans (WPSP) that may be required for the completion of the Contract or incidental work. If such plans are required, the general contractor is responsible for retaining a registered design professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

- I. All work shall be done during regular working hours unless the asbestos abatement contractor requests authorization to work in other than regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.
- J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the asbestos abatement contractor to pay premium or overtime wages to complete the work. If the Commissioner orders work in other than regular working hours, the asbestos abatement contractor shall multiply the unit price for that portion of the work



requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

**1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR**

- A. Requirements: The asbestos abatement contractor must be approved through the Department's Request for Subcontractor Approval, administered by the Agency Chief Contracting Office (ACCO), Vendor Integrity Unit. The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (6) below. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work that it has been licensed by the New York State Department of Labor (NYSDOL), as an "Asbestos Abatement Contractor". The asbestos abatement contractor shall submit copies of the asbestos abatement contractors NYSDOL License for the past three years.
  2. The asbestos abatement contractor must, for the three-year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
  3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must submit a list of five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$1,000,000 in each of the three years.
  4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number and email address of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the scope of work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
  5. The asbestos abatement contractor must demonstrate that it has the financial resources, certified supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and



Construction to demonstrate that it has the requisite capacity to perform the required services of this contract. The Department may also conduct an inspection of the asbestos abatement contractor's facility to verify if the contractor has equipment and staffing to perform the work.

6. The asbestos abatement contractor must submit a copy of their Corporate Health and Safety Plan for review and acceptance. A Job Hazard Analysis (JHA) for the specific work conducted must be included.
- B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.
- C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to (1) through (5) below. The asbestos abatement contractor will attend a walkthrough site inspection with the department's Project Manager and the Third-Party Air Monitor prior to the work. Such walkthrough will be scheduled at the Department's convenience.
1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.
  2. Handling, storage, transportation and disposal of the material.
  3. Availability of qualified and skilled labor.
  4. Availability of utilities.
  5. Exact quantities of all materials to be disturbed and/or removed

### **1.03 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES**

The asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above.



In the event that the project is not classified as "urgent" the asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

- A. Name and address of building City or operator;
- B. Project description:
  - 1. Size - square feet, number of linear feet, etc;
  - 2. Age - date of construction and renovations (if known);
  - 3. Use - i.e., office, school, industrial, etc.
  - 4. Scope - repair, demolition, cleaning, etc.
- C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;
- D. Building location/address, including Block and Lot numbers;
- E. Work schedule including the starting and completion dates;
- F. Abatement methods to be employed;
- G. Procedures for removal of asbestos-containing material;
- H. Name, title and authority of governmental representative sponsoring project.

**1.04 WORK INCLUDED IN UNIT PRICE**

The asbestos abatement contractor will be paid a basic unit price of **\$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

**1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR**

- A. "Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400 or the



provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.

- B. Air monitoring of asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).
- C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.

#### **1.06 THIRD PARTY MONITORING AND LABORATORY**

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).
- C. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- D. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the asbestos abatement contractor.

#### **1.07 PAYMENT REQUEST DOCUMENTATION**

- A. The following information shall be included for each payment request:
  - 1. Description of work performed.



2. Linear footage and pipe sizes involved.
  3. Square footage for boiler & breaching insulation removed.
  4. Square footage of non pipe and boiler areas removed, patched, enclosed, sealed, or painted.
  5. Square footage of encapsulation, sealing, patching, and painting involved.
  6. Total cost associated with compliance with the assigned task.
  7. Architectural, Electrical, HVAC, Plumbing, etc. work incidental to the Asbestos Abatement Work.
  8. A certified copy (in form 4312-39) to the Comptroller or Financial Officer of the New York City to the effect that the financial statement is true.
  9. A signed copy (in form 6506q-6) of certificate of compliance with non-discriminatory provisions of the Contract.
  10. Attach a copy of valid workmen compensation insurance.
  11. Valid asbestos insurance per occurrence.
  12. General liability insurance when required.
- B. Each payment request shall include a grand total for all work completed that billing period, the landfill waste manifests and a copy of waste transporter permit. The Department of Design and Construction will inspect the work performed, review the cost and approve or disapprove requests for payment.
- C. EXPOSURE LOG: With this final payment, the asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

**1.08 QUANTITY CALCULATIONS**

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

PIPE INSULATION SIZE O.D.	PIPE SIZE O.D.	SQUARE FOOTAGE PER LINEAR FOOT
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72
3"	1"	0.79
3-1/4"	1-1/4"	0.85

3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5"	3"	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9"	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	14"	4.71

**1.09 METHOD OF PAYMENT**

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement contractor, times the unit price specified below. Credits may apply to certain times, as specified below.

**A. REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING PIPE INSULATION:** Actual linear footage, multiplied by the square footage factor listed for the respective pipe size in Section 1.08, multiplied by the unit price in Section 1.04.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

$100 \times 0.65 = 65 \text{ sq.ft.}$        $65 \times \text{unit price} = \text{Payment}$

$100 \times 2.62 = 262 \text{ sq.ft.}$        $262 \times \text{unit price} = \text{Payment}$

**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.



- a. **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.
- b. **REMOVAL, DISPOSAL AND REPLACEMENT OF DUCT INSULATION:** Payment shall be made at 1.0 times the unit price per square foot.
- c. **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.
- d. **ACOUSTIC PLASTER REPAIR AND/OR ENCAPSULATION:** Payment shall be made at 0.5 times the unit price per square foot.
- e. **PATCHING OR REPAIR** of items listed in A through F will be paid at 0.33 times the unit price per square foot.
- f. **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.
- g. **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.
- h. **PAINTING:** Payment shall be made at 0.05 times the unit price per square foot.
- i. **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.
- j. **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.
- k. **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.

- l. **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.
- m. **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.
- n. **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.
- o. **REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING WINDOW/DOOR CAULKING:** including friable and non-friable caulking, weather-stripping, glazing, sealants or other waterproofing materials applied to windows, doors, skylights, etc. Payment shall be made at the rate of \$400.00 per opening regardless of size or configuration. This cost includes labor, consumable materials, set-up/breakdown, removal and disposal, as required.

**Note 1: CREDIT:** For items listed in A through F, a credit at a rate of 0.33 times the unit price, times the respective multiplier (for each item) will be taken for each square foot of insulation which the asbestos abatement contractor is not directed to reapply.

**Note 2: MINIMUM PAYMENT:** The minimum payment per call at any individual job sites or various job sites during the same day will be eight hundred dollars (\$800.00).

**Note 3:** All payments shall be made as described in paragraph 1.09 herein.

**Note 4: WORKING HIGHER THAN 12 FEET ABOVE FLOOR LEVEL OR WORK REQUIRING COMPLEX SCAFFOLDING OR CONSTRUCTION WORK PLATFORMS:** Provisions are made in this Contract to compensate the asbestos abatement contractor for work performed in locations that are difficult to access due to work at elevations that are significantly higher than the normal work level. The unit price for these items will be paid at 1.20 times the unit price described in Paragraphs 1.09, A through R for those portions of the work that are more than twelve (12) feet above the grade for that would be judged as the normal working level.

**1.10 GUARANTEE**

- A. Work performed in compliance with each task shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.
- B. The Commissioner of The Department of Design and Construction will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

**1.11 OCCUPANCY OF SITE NOT EXCLUSIVE**

Attention is specifically drawn to the fact that contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may be brought upon any site of the work of this Contract. This paragraph applies to those areas outside the regulated Work Area as defined by Title 15, Chapter I of RCNY.

**1.12 SUBMITTALS**

- A. Pre-Construction Submittals:
  - 1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items:
    - a. asbestos abatement contractor's scope of work, work plan and schedule.
    - b. Asbestos project notifications, approved variances and plans to Government Agencies.
    - c. Copies of Permits, clearance and licenses if required.
    - d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. asbestos abatement contractor shall post a copy of all schedules at the site:
      - (1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning,



encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

- (2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.
  - (3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.
- e. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number to nearest hospital) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.
- f. Safety Data Sheets (SDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until SDS are reviewed.
- g. Worker Training and Medical Surveillance: The asbestos abatement contractor shall submit a list of the persons who will be employed by him /her to perform the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
- h. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.
- (1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of the asbestos abatement contractor; name, address and phone number of asbestos abatement contractor and City's third party air monitoring firm; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved for entry into the Work Area.



(2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the asbestos abatement contractor shall submit the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

i. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

**B. During Construction Submittals:**

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
3. Floor plans indicating asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager.
4. All asbestos abatement contractors' air monitoring and inspection results.

**C. Project Closeout Submittals:**

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, sub-asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,



4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,
6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
  - a. Fully executed disposal certificates and transportation manifest.
8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:
  - a. Copies of licenses of all asbestos abatement contractors involved in the project;
  - b. Copies of NYCDEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
  - c. Copies of all project notifications and reports filed with NYCDEP, NYSDOL and USEPA for the project, with any amendments or variances;
  - d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
  - e. A copy of the air sampling log and all air sampling results;
  - f. A copy of the abatement asbestos abatement contractor's daily log book;
  - g. Copies of all asbestos waste manifests;
  - h. A copy of all Project Monitor's Reports (ACP-15).
  - i. A copy of each ATR-1 Form completed for the asbestos project (if required).
  - j. A copy of each Asbestos Project Conditional Closeout Report (ACP-20) if required.

- k. A copy of the Asbestos Project Completion Form (ACP-21).

**1.13 PROTECTION OF FURNITURE AND EQUIPMENT**

Cover all furniture and equipment that cannot be removed from Work Areas. Movable furniture and equipment will be removed from Work Areas by the asbestos abatement contractor prior to start of work. At the conclusion of the work (after final air testing), the asbestos abatement contractor will remove all plastic covering on walls, floors, furniture, equipment and reinstall furniture and equipment. He shall remove and store all sheaths, curtains and drapes, and reinstall same following final clean up.

**1.14 UTILITIES**

A. General:

All temporary facilities shall be subject to the approval of the Commissioner. Prior to starting work at any site, locations and/or sketches (if required) of temporary facilities must be submitted to the Construction Project Manager for the required approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. However, it is the responsibility of the asbestos abatement contractor to ensure that hot water is provided for showering in the decontamination unit. The asbestos abatement contractor shall furnish, install and maintain any needed equipment to meet these requirements at his own expense.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in a building, under their jurisdiction. The asbestos abatement contractor is responsible for routing the electric power to the abatement Work Area.

All temporary lighting and temporary electrical service for Work Area shall be in weatherproof enclosures and be ground fault protected.

- D. In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the general contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.



**1.15 FEES**

The asbestos abatement contractor shall be responsible for any and all fees or charges imposed by Local, State or Federal Law, Rule and Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

**END OF SECTION**

**SECTION 028213**  
**NOVEMBER 2017 VERSION**

**ASBESTOS ABATEMENT**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. The Contract Documents are as defined in the “Agreement”. The General Conditions shall apply to all Work of this Section.
- B. Work specified herein shall be the removal and disposal of Asbestos-Containing Materials (ACM) and asbestos-contaminated materials from designated areas of the DSNY Staten Island District 3 Garage, 1000 West Service Road, Staten Island, New York, 10314.
- 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 “District SI-3 Garage & Repair Shop HVAC System and Roof Replacement” (50% Construction Documents), dated 07/18/18, prepared by WSP USA Inc.;
  - 2. Asbestos Survey Report performed by LiRo Engineers, Inc. titled “DSNY District SI-3 Garage & Repair Shop HVAC System and Roof Replacement” dated 09/20/18.
- D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

**1.02 SCOPE OF WORK**

- A. The asbestos abatement contractor is to provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement of ACM as required by these contract documents. All work shall be performed in accordance with this Specification, EPA regulations, OSHA regulations, New York City Local Law 70, Title 15, Chapter 1 RCNY, New York State Industrial Code 56, NIOSH recommendations, and any other applicable federal, state or local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.



- B. The intent of this Specification section is to ensure that the asbestos abatement contractor is responsible for the following:
1. Abatement of all ACM.
  2. Cleaning and decontamination of the entire affected area.
  3. Demolition that may be required to access ACM in each area, Asbestos abatement contractor shall dispose of all debris associated with demolition activities as ACM waste.
  4. Removal and disposal of all ACM found within these areas such as flashing/tar, parapet wall covering/membrane, skylight flashing/tar, a/c dunnage flashing/tar, heat exchange unit flashing/tar, pitch pocket sealant/tar, make up air unit pitch pocket sealant/tar, roof membrane, a/c units flashing/tar, condenser's dunnage flashing/tar, gooseneck exhaust flashing/tar, we/te exhaust flashing/tar, parapet wall membrane, roof drain flashing/tar, roof exhaust fan flashing/tar, roof vent/flue flashing/tar.
  5. Provide all scaffolding, platform installation, equipment, tools, transportation and any other equipment required and/or necessary to complete all work described in the Contract Documents.
  6. The asbestos abatement contractor shall be responsible for and shall include any and all fees or changes imposed by Local, State or Federal Law, Rule or Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the work.
  7. Prior to destructive demolition activities, the DDC may elect to collect bulk samples of assumed asbestos-containing materials and analyze the bulk samples for asbestos content.
- C. The asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work.
1. **Drawing H002.00: Roof Partial Plan - North**
    - a. Remove and dispose of asbestos-containing roof flashing/tar black, parapet wall covering/membrane black, skylight flashing/tar black, A/C dunnage flashing/tar black, heat exchange unit flashing/tar black, pitch pocket sealant/tar black, make up air unit pitch pocket sealant/tar black, roof drain flashing/tar black, exhaust fan flashing/tar black, and vent/flue flashing/tar black within **Work Area 1**. Asbestos-containing roof flashing/tar black, parapet wall

covering/membrane black, skylight flashing/tar black, A/C dunnage flashing/tar black, heat exchange unit flashing/tar black, pitch pocket sealant/tar black, make up air unit pitch pocket sealant/tar black, roof drain flashing/tar black, exhaust fan flashing/tar black, and vent/flue flashing/tar black shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-107 Foam Procedure for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1	NYCDEP Section § 1-107 Foam Procedures for Roof Removal.	540 Sq. Ft. of Roof Flashing/Tar - Black	-
		2,160 Sq. Ft. of Parapet Wall Covering/Membrane -Black	
		54 Sq. Ft of Skylight Flashing/Tar - Black	
		12 Sq. Ft of A/C Dunnage Flashing/Tar - Black	
		54 Sq. Ft of Heat Exchange Unit Flashing/Tar - Black	
		4 Sq. Ft. of Pitch Pocket Sealant/Tar - Black	
		2 Sq. Ft. of Make Up Air Unit Pitch Pocket Sealant/Tar-Black	
		12 Sq. Ft. of Roof Drain Flashing/Tar - Black	
		160 Sq. Ft. of Exhaust Fan Flashing/Tar - Black	
		10 Sq. Ft. of Vent/Flue Flashing/Tar - Black	

**1. Drawing H003.00: Roof Plan - Middle**

- b. Remove and dispose of asbestos-containing roof flashing/tar black, parapet wall covering/membrane black, make up air unit flashing/tar black, A/C flashing/tar black, TE exhaust flashing/tar black, roof drain flashing/tar black within **Work Area 2**. Asbestos-containing roof flashing/tar black, parapet wall covering/membrane black, make up air unit flashing/tar black, A/C flashing/tar black, TE exhaust flashing/tar black, roof drain flashing/tar black shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-107 Foam Procedures for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
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2	NYCDEP Section § 1-107 Foam Procedures for Roof Removal.	660 Sq. Ft. of Roof Flashing/Tar - Black	-
		1,680 Sq. Ft. of Parapet Wall Covering/Membrane - Black	
		30 Sq. Ft. of Make-up Air Unit Flashing/Tar - Black	
		36 Sq. Ft. of A/C Flashing/Tar - Black	
		48 Sq. Ft. of TE Exhaust Flashing/Tar - Black	
		6 Sq. Ft. of Roof Drain Flashing/Tar - Black	

**1. Drawing H004.00: Roof Plan - Bulkhead**

- c. Remove and dispose of asbestos-containing roof flashing/tar gray, and roof drain flashing/tar black within **Work Area 3**. Asbestos-containing roof flashing/tar gray, and roof drain flashing/tar black shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-107 Foam Procedures for Roof Removal.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
3	NYCDEP Section § 1-107 Foam Procedures for Roof Removal.	54 Sq. Ft. of Roof Flashing/Tar - Gray	-
		2 Sq. Ft. of Roof Drain Flashing/Tar - Black	

**1. Drawing H005.00: Roof Partial Plan - South**

- d. Remove and dispose of asbestos-containing roof membrane black, roof flashing/tar black, A/C units flashing/tar black, condenser dunnage flashing/tar black, gooseneck exhaust flashing/tar black, pitch pocket sealant/tar black, WE/TE exhaust flashing/tar black, roof drain flashing/tar black, exhaust fan flashing/tar black, and vent/flue flashing/tar black within **Work Area 4**. Asbestos-containing roof membrane black, roof flashing/tar black, A/C units flashing/tar black, condenser dunnage flashing/tar black, gooseneck exhaust flashing/tar black, pitch pocket sealant/tar black, WE/TE exhaust flashing/tar black, roof drain flashing/tar black, exhaust fan flashing/tar black, and vent/flue flashing/tar black shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-107 Foam Procedures for Roof Removal.



Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
4	NYCDEP Section § 1-107 Foam Procedures for Roof Removal.	36,000 Sq. Ft. of Roof Membrane - Black	-
		660 Sq. Ft. of Roof Flashing/Tar - Black	
		60 Sq. Ft. of A/C Units Flashing/Tar - Black	
		12 Sq. Ft. of Condenser Dunnage Flashing/Tar - Black	
		24 Sq. Ft. of Gooseneck Exhaust Flashing/Tar - Black	
		4 Sq. Ft. of Pitch Pocket Sealant/Tar - Black	
		48 Sq. Ft. of WE/TE Exhaust Flashing/Tar - Black	
		12 Sq. Ft. of Roof Drain Flashing/Tar - Black	
		80 Sq. Ft. of Exhaust Fan Flashing/Tar - Black	
		5 Sq. Ft. of Vent/Flue Flashing/Tar - Black	

- D. The facility is under the jurisdiction of the New York City Department of Sanitation. The asbestos abatement contractor shall perform the work of this contract in a manner that will be least disruptive to the normal use of the building.
- E. Asbestos abatement contractor's attention is directed to the fact that patents cover certain methods of asbestos abatement indicated in the specifications. To date, patents have been issued with regard to negative pressure enclosures or negative or reduced pressure and glove-bag.
- F. Asbestos abatement contractor shall be solely responsible for and shall hold the City of New York Department of Design and Construction and the City harmless from, any and all damages, losses and expenses resulting from any infringement by Asbestos abatement contractor of any patent, including but not limited to the patents described above, used by Asbestos abatement contractor during performance of this agreement.
- G. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the City of New York Department of Design and Construction if he anticipates any difficulty in performing the work as directed and required by these Specifications. Asbestos abatement contractor shall be required to attend an on-site job meeting with the Construction Project Manager prior to start of work to



examine conditions of the site for removal and plan the sequence for removal operations.

- H. The asbestos abatement contractor shall retain a certified Project Designer for the preparation of an Asbestos Variance Application (ACP-9), if required.
- I. The asbestos abatement contractor shall be responsible for preparing and submitting all filings, notifications, amendments and variances, etc. required by all City, State and Federal regulatory agencies having jurisdiction, at no additional cost to the NYC DDC.
- J. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to prepare a Work Place Safety Plan (WPSP), if required.
- K. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to perform final inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required under Chapter 17 of the Building Code. Such special inspections and A-TR1 forms shall be completed by the Registered Design professional.
- L. For coordination with other Asbestos abatement contractors, see the General Conditions governing all Contracts.
- M. Related Asbestos Removal Work Under Other Contracts:
  - 1. Each asbestos abatement contractor shall be responsible for the removal of incidental asbestos not identified in this section and found prior to or during the Work.
  - 2. Incidental asbestos is defined as ACM that is discovered during the course of their work that must be abated to enable them to perform the work of their Contract.
- N. Work Hours:
  - 1. The asbestos abatement contractor shall establish his work schedule in a way that avoids interference or conflict with the normal functioning of the facility. Work in the evenings shall be done at no additional cost to the City.
  - 2. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work other than regular working hours and such authorization is granted by the Commissioner



- (Regular working hours are those during which any given facility in which work is to be done is customarily open and functioning). If such work schedule is authorized by the Commissioner the work shall be done at no additional cost to the City.
3. The order of phases and start dates associated with each will be determined by the Construction Project Manager.
  4. Asbestos abatement contractor shall be required to schedule waste transfer during evening hours, when activity within the facility is at a minimum. Evening hours are defined as 6:00 p.m. to 6:00 a.m. Waste transfer must be approved by the Construction Project Manager and Facility Manager.
- O. The following conditions shall apply to all temporary shutdowns of existing services:
1. All temporary lighting and temporary electrical services for use in the Work Area shall be in weather proof enclosures and be ground fault protected and:
    - a. Shall be performed at no additional charge to the City.
  2. Shall be performed at times not interfering with the other activities in the building.
  3. Shall be performed only with written consent from the Commissioner and the Facility Manager.
  4. Shall be made through written request to the Commissioner at least 10 days in advance with complete written description of the work to be performed.
- P. Stages of Asbestos Removal Work:
1. The asbestos abatement contractor will be required to perform the work and it is the intent of this Specification to remove all asbestos containing and asbestos contaminated materials from the Work Area. The asbestos abatement contractor is responsible for verifying all quantities of materials listed.
- Q. Certain equipment in the Work Area may need to remain operational during removal. Therefore, the removal of ACM from this equipment shall be performed as the last removal activities within the Work Area. The Asbestos abatement contractor shall coordinate the scheduling for the removal of ACM on functioning equipment with the Construction Project Manager.

### **1.03 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR**



- A. Requirements: The asbestos abatement contractor must be approved through the Department's Request for Subcontractor Approval, administered by the Agency Chief Contracting Office (ACCO), Vendor Integrity Unit. The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (6) below. Such documentation shall include without limitation, all required licenses, certificates, and documentation.
1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work that it has been licensed by the New York State Department of Labor (NYS DOL), as an "Asbestos Abatement Contractor". The asbestos abatement contractor shall submit copies of the asbestos abatement contractors NYSDOL License for the past three years
  2. The asbestos abatement contractor must, for the three-year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
  3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must submit a list of five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least \$1,000,000 in each of the three years.
  4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number and email address of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the scope of work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
  5. The asbestos abatement contractor must demonstrate that it has the financial resources, certified supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract. The Department may also conduct an inspection of the asbestos abatement contractor's facility to verify if the contractor has equipment and staffing to perform the work.



6. The asbestos abatement contractor must submit a copy of their Corporate Health and Safety Plan for review and acceptance. A Job Hazard Analysis (JHA) for the specific work conducted must be included.
  
- B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.
  
- C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to (1) through (5) below. The asbestos abatement contractor will attend a walkthrough site inspection with the department's Project Manager and the Third-Party Air Monitor prior to the work. Such walkthrough will be scheduled at the Department's convenience.
  1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.
  2. Handling, storage, transportation and disposal of the material.
  3. Availability of qualified and skilled labor.
  4. Availability of utilities.
  5. Exact quantities of all materials to be disturbed and/or removed.

#### **1.04 WORK BY OTHERS**

The City reserves the right during the term of this Contract to have work performed on asbestos abatement projects by other asbestos abatement contractors as the situation warrants.

#### **1.05 DEFINITIONS**

- A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.
  
- B. Definitions in General Use:



1. **Approve:** Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Asbestos abatement contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in Contract Documents. In no case will "approval" by Engineer be interpreted as a release of Asbestos abatement contractor from responsibilities to fulfill requirements of Contract Documents.
2. **Directed, Requested, etc.:** Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Asbestos abatement contractor's responsibility for construction supervision.
3. **Furnish:** Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
4. **Indicated:** The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
5. **Install:** Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
6. **Installer:** The term "installer" is defined as the entity (person or firm) engaged by the asbestos abatement contractor, or its sub-asbestos abatement contractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.
7. **Provide:** Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
8. **Third-Party Air Monitor:** The term "Third-Party Air Monitor" is defined as an entity engaged by City and Construction Project Manager to perform



specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

C. Definitions Relative to Asbestos Abatement:

1. **Abatement:** Any and all procedures physically taken to control fiber release from asbestos-containing materials. This includes removal, encapsulation, enclosure, cleanup and repair.
2. **Adequately Wet:** The complete penetration of a material with amended water to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet. ACM must be fully penetrated with the wetting agent in order to be considered adequately wet. If the ACM being abated is resistant to amended water penetration, wetting agent shall be applied to the material prior to and during removal as necessary to minimize fiber release.
3. **Aggressive Sampling:** Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.
4. **AHERA:** Asbestos Hazard Emergency Response Act of 1986
5. **AIHA:** American Industrial Hygiene Association.
6. **Airlock:** System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.
7. **Air Sampling:** Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.
8. **Ambient Air Monitoring:** "Ambient air monitoring" shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the worksite.



9. Amended Water: Water to which a surfactant has been added.
10. ANSI: American National Standards Institute
11. Area Air Sampling: Any form of air sampling or monitoring where the sampling device is placed at some stationary location.
12. Asbestos: Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.
13. Asbestos-Containing Material (ACM): Asbestos or any material containing more than one-percent asbestos.
14. Asbestos-Containing Waste Material: ACM, asbestos-contaminated objects or debris associated with asbestos abatement requiring disposal.
15. Asbestos-Contaminated Objects: Any objects which have been contaminated by asbestos or asbestos-containing material.
16. Asbestos Assessment Report: "Asbestos Assessment Report" shall mean the "Form ACP-5" form, as approved by NYCDEP, by which a NYCDEP-certified asbestos investigator certifies that a building or structure (or portion thereof) is free of ACM or the amount of ACM to be abated constitutes a minor project.
17. Asbestos Handler: Individual who disturbs, removes, repairs, or encloses asbestos material. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
18. Asbestos Handler Supervisor: Individual who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.
19. Asbestos Investigator: An individual certified by NYCDEP as having successfully demonstrated his or her ability to identify the presence of and evaluate the condition of asbestos in a building or structure.
20. Asbestos Project: Any form of work performed in a building or structure which will disturb (e.g., remove, enclose, encapsulate) asbestos-containing material.



21. ASTM: American Society for Testing and Materials.
22. Asbestos Project Notification: The "Form ACP-7" asbestos project notification form as approved by DEP.
23. Authorized Visitor: Authorized visitor shall mean the building owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.
24. Building Owner: Person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building Owner means the person in whom beneficial title is vested.
25. Building Materials: Any and all manmade materials, including but not limited to interior and exterior finishes, equipment, bricks, mortar, concrete, plaster, roofing, flooring, caulking, sealants, tiles, insulation, and outdoor paving such as sidewalks, paving tiles and asphalt.
26. Certified Industrial Hygienist (CIH): Individual with a minimum of five years experience as an industrial hygienist and who has successfully completed both levels of the examination administered by the American Board of Industrial Hygiene and who is currently certified by that board.
27. Certified Safety Professional (CSP): Individual having a bachelor's degree from an accredited college or university and a minimum of four years experience as a safety professional and who has successfully completed both levels of the examination administered by the Board of Certified Safety Professionals and who is currently certified by that board.
28. Chain of Custody: "Chain of Custody" shall mean the form or set of forms that document the collection and transfer of a sample.
29. City: City of New York
30. Clean Room: An uncontaminated area or room that is part of worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.
31. Clearance Air Monitoring: Employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers and shall be performed as the final abatement activity.
32. Commissioner: shall mean the head of the Agency that has entered into this contract or his/her duly authorized representative.



33. Competent Person: Shall mean the designated person as defined by OSHA in 29 CFR1926.1101.
34. Curtained Doorway: Device that consists of at least three overlapping sheets of fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.
35. Decontamination Enclosure System: Series of connected rooms, separated from the Work Area and from each other by air locks, for the decontamination of workers, materials, waste containers, and equipment.
36. Demolition: The dismantling or razing of a building, including all operations incidental thereto (except for asbestos abatement activities), for which a demolition permit from the New York City Department of Buildings is required.
37. Department: shall mean the New York City Department of Design and Construction (DDC).
38. NYCDEP or DEP: The New York City Department of Environmental Protection.
39. Disturb: Any action taken which may alter, change, or stir, such as but not limited to the removal, encapsulation, enclosure or repair of asbestos-containing material.
40. DOB: The New York City Department of Buildings.
41. Egress: A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.
42. ELAP: Environmental Laboratory Approval Program administered by the New York State Department of Health.
43. Encapsulant (sealant) or Encapsulating Agent: Liquid material which can be applied to ACM and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of



- the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
44. Encapsulation: The coating or spraying of asbestos-containing material encapsulant. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
  45. Enclosure: Construction of airtight walls and/or ceilings between ACM and the facility environment, or around surfaces coated with ACM, or any other appropriate procedure as determined by the NYCDEP which prevents the release of asbestos fibers.
  46. EPA or USEPA: United States Environmental Protection Agency.
  47. Equipment Room: Contaminated area or room that is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.
  48. Exit: That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction to provide a protected path of egress travel between the exit access and the exit discharge.
  49. FDNY: The Fire Department of the City of New York.
  50. Fiber: An acicular single crystal or a similarity elongated polycrystalline aggregate which displays some resemblance to organic fibers by having such properties as flexibility, high aspect ratio, silky luster, axial lineation, and others, and which has attained its shape primarily through growth rather than cleavage.
  51. Fixed Object: A unit of equipment, furniture, or other item in the work area which cannot be removed from the work area. Fixed objects shall include equipment, furniture, or other items that are attached, in whole or in part, to a floor, ceiling, wall, or other building structure or system or to another fixed object and cannot be reasonably removed from the work area. Fixed objects shall also include pipes and other equipment inside the work area which are not the subject of the asbestos project. Active fire suppression system components shall not be considered fixed objects.
  52. Glovebag technique: shall mean a method for removing asbestos-containing material from heating, ventilation and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces. The



glovebag assembly is a manufactured device consisting of a large bag (constructed of at least 6-mil transparent plastic), two inward-projecting long sleeve gloves, one inward-projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process.

53. HEPA-Filter: High efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers mass median aerodynamic equivalent diameter.
54. HEPA vacuum equipment: "HEPA vacuum equipment" shall mean vacuuming equipment with a HEPA filter.
55. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.
56. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.
57. Industrial Hygiene: Science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among worker or among the citizens of the community.
58. Industrial Hygienist: Individual having a college or university degree or degrees in Engineering, Chemistry, Physics or Medicine, or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:
  - a. To recognize the environmental factors and to understand their effect on people and their well being; and
  - b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair people's health and well being; and
  - c. To prescribe methods to eliminate, control, or reduce such stresses when necessary to alleviate their efforts.



59. Isolation Barrier: The construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the work place from surrounding areas and to contain asbestos fibers in the work area.
60. Large Asbestos Project: Asbestos project involving the disturbances (e.g., removal, enclosure, encapsulation) of 260 linear feet or more of ACM or 160 square feet or more of ACM.
61. Log: An official record of all activities that occurred during the project. At a minimum, the log shall identify the building owner, agent, asbestos abatement contractor, and workers, and other pertinent information including daily activities, cleanings and waste transfers, names and certificate numbers of asbestos handler supervisors and asbestos handlers; results of inspections of decontamination systems, barriers, and negative pressure ventilation equipment; summary of corrective actions and repairs; work stoppages with reason for stoppage; manometer readings at least twice per work shift; daily checks of emergency and fire exits and any unusual events.
62. Minor Project: A project involving the disturbance (e.g., removal, enclosure, encapsulation, repair) of 25 linear feet or less of asbestos containing material or 10 square feet or less of asbestos containing material.
63. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.
64. Negative Air Pressure Equipment: Portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside and inside of the Work Area.
65. NESHAPS: National Emission Standards for Hazardous Air Pollutants.
66. NFPA: The National Fire Protection Association.
67. NIOSH: National Institute for Occupational Safety and Health.
68. DEP or NYCDEP: New York City Department of Environmental Protection
69. NYSDOL: New York State Department of Labor.
70. NYSDOL ICR 56: "NYSDOL ICR 56" shall mean Part 56 of the Official Compilation of Codes, Rules and Regulations of the State of New York or 12 NYCRR Part 56.
71. NYSDOH: The New York State Department of Health.



72. **Obstruction:** The blocking of a means of egress with any temporary structure or barrier. A double layer of fire-retardant 6-mil polyethylene sheeting shall not be considered an obstruction when it is prominently marked as an exit with photo luminescent signage or paint and cutting tools (knife, razor) are attached to the work area side of the sheeting for use in the event that the sheeting must be cut to permit egress. A corridor shall not be considered obstructed when there is a clear path measuring at least three (3) feet wide.
73. **Occupied Area:** Area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.
74. **OSHA:** Occupational Safety and Health Administration.
75. **Outside air:** "Outside air" shall mean the air outside the work place.
76. **Person:** Individual, partnership, company, corporation, association, firm, organization, governmental agency, administration, or department, or any other group of individuals, or any officer or employee thereof.
77. **Personal Air Monitoring:** Method used to determine employees' exposure to airborne asbestos fibers. The sample is collected outside the respirator in the worker's breathing zone.
78. **Personal Protective Equipment (PPE):** Appropriate protective clothing, gloves, eye protection, footwear, and head gear.
79. **Phase Contrast Microscopy (PCM):** The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400).
80. **Physician:** Person licensed or otherwise authorized under Article 131 Section 65.22 of the New York State Education Law.
81. **Plasticize:** To cover floors and walls with fire retardant plastic sheeting as herein specified or by using spray plastics as acceptable to the Department.
82. **Polarized Light Microscopy (PLM):** The measurement protocol for the assessment of the asbestos content of bulk materials. (Interim Method for the Determination of Asbestiform Materials in Bulk Insulation Samples- 40 CFR Part 763, Subpart F, Appendix A as amended on September 1, 1982)
83. **Project Designer:** A person who holds a valid Project Designer Certificate issued by the New York State Department of Labor.



84. **Project Monitor:** A person who holds a valid Project Monitor Certificate issued by the New York State Department of Labor.
85. **Qualitative Fit Test:** Individual test subject's responding (either voluntarily or involuntarily) to a chemical challenge outside the respirator face-piece. Acceptable methods include irritant smoke test, odorous vapor test, and taste test.
86. **Quantitative Fit Test:** Exposing the respiratory wearer to a test atmosphere containing an easily detectable, nontoxic aerosol, vapor or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside the face-piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents, and exercises to perform during the test.
87. **Registered Design Professional:** A person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York.
88. **Removal:** Stripping of any asbestos- containing materials from surfaces or components of a facility or taking out structural components in accordance with 40 CFR 61 Subparts A and M.
89. **Renovation:** An addition or alteration or change or modification of a building or the service equipment thereof, that is not classified as an ordinary repair as defined in §27-125 of the Administrative Code of the City of New York.
90. **Repair:** Corrective action using specified work practices (e.g., glovebag, plastic tent procedures, etc.) to minimize the likelihood of fiber release from minimally damaged areas of ACM.
91. **Replacement material:** Any material used to replace ACM that contains less than .01 percent asbestos.
92. **Shift:** A worker's, or simultaneous group of workers', complete daily term of work.
93. **Shower Room:** Room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.
94. **Small Asbestos Project:** Asbestos project involving the disturbance (e.g., removal, enclosure, encapsulation) of more than 25 and less than 260 linear feet of ACM or more than ten and less than 160 square feet of ACM.



95. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.
96. Strip: To remove asbestos materials from any part of the facility.
97. Structural Member: Load-supporting member of a facility, such as beams and load-supporting walls, or any non-load-supporting member, such as ceiling and non-load-supporting walls.
98. Surface barriers: The plasticizing of walls, floors, and fixed objects within the work area to prevent contamination from subsequent work.
99. Surfactant: Chemical wetting agent added to water to improve penetration.
100. Transmission Electron Microscopy (TEM): The measurement protocol for the assessment of the asbestos fiber content of air. Interim Transmission Electron Microscopy Analytical Methods-40 CFR Part 763, Subpart E, Appendix A.
101. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.
102. Washroom: Room between the Work Area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA-vacuumed prior to disposal.
103. Waste decontamination enclosure system: "Waste decontamination enclosure system" shall mean the decontamination enclosure system designated for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.
104. Wet Cleaning: "Wet cleaning" shall mean the removal of asbestos fibers from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water.
105. Wet methods: "Wet methods" shall mean the use of amended water or removal encapsulants to minimize the generation of fibers during ACM disturbance.
106. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.



107. Worker Decontamination Enclosure System: Portion of a decontamination enclosure system designed for controlled passage of workers and authorized visitors, consisting of a clean room, a shower room, and an equipment room separated from each other and from the Work Area by airlocks and curtained doorways.
108. Work Place: The work area and the decontamination enclosure system(s).
109. Work Place Safety Plan: Construction documents prepared by a registered design professional and submitted for review by DEP in order to obtain an asbestos abatement permit. Such plan shall include, but not be limited to, plans, sections, and details of the work area clearly showing the extent, sequence, and means and methods by which the work is to be performed.
110. Work Site: Premises where abatement activity is being performed. May be composed of one or more Work Areas.

#### **1.06 STANDARD OPERATING PROCEDURES**

- A. Develop and implement a written standard procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, employees, public, and environment.
- B. TELEPHONE DEVICE

The asbestos abatement contractor or his authorized representative shall, at all times during the normal workday or during periods of overtime work under this Contract, carry a mobile cellular telephone capable of transmitting photographs and data. He/she shall supply the Department of Design and Construction with the phone number for the device and he/she is liable to respond back to the calls from DDC within the next one (1) hour period after he/she receives calls from DDC. The cost to the asbestos abatement contractor for this device and all charges accruing thereto is deemed included in the work.

- C. The standard operating procedure shall ensure:
  1. Tight security from unauthorized entry into the workspace.
  2. Restriction of asbestos abatement contractor's personnel to the immediate Work Area and access/egress routes.
  3. Donning of proper protective clothing and respiratory protection prior to entering the Work Area.



4. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking the respiratory protection.
  5. Proper exit practices from the work space to the outside through the showering and decontamination facilities.
  6. Removing asbestos in a way that minimizes release of fibers.
  7. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimizes exposure and contamination.
  8. Emergency evacuation procedures, for medical or safety situations, to minimize the potential exposure to airborne asbestos fibers for emergency personnel, building occupants, and building environment.
  9. Safety from accidents in the workspace, especially from electrical shocks, fall hazards associated with scaffolding, slippery surfaces, and entanglements in loose hoses and equipment.
  10. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.
  11. Engineering controls that minimize exposure to fibers within the workspace.
  12. The asbestos abatement contractor shall provide a 24-hour fire watch throughout the entire term of the project, to protect against fire and unauthorized entry into the workspace when required by the NYCDEP. Fire watch shall be performed by an individual who is a certified asbestos worker capable of entering the Work Area for regular inspections.
- D. Provide an Asbestos Handler Supervisor to provide continuous supervision of all work, and to be responsible for the following:
1. Ensure that individuals are using proper personal protective equipment, are trained in its use and hold valid NYCDEP and NYSDOL Asbestos Handler certificates.
  2. Maintain entry log records and ensure that they are recorded in accordance with the provisions of Title 15, Chapter 1 of RCNY and NYSDOL ICR 56.
  3. Surveillance of the Work Areas at a minimum of once per work shift or as required by Title 15, Chapter 1 of RCNY and NYSDOL ICR 56 -7.3, to ensure the integrity of work place isolation, negative pressure equipment and workers personal protective equipment is not torn or ripped and that respiratory protection is worn at all times.



4. Ensure that sufficient personal protective equipment is stored in the clean room.
5. Take precautions to prevent heat stress. Precautions include, but are not limited to, selecting lightweight protective clothing, reducing the work rate, and providing adequate fluid breaks.
6. Perform work area inspection with project monitor prior to the commencement of final clearance air monitoring.
7. The asbestos abatement contractor shall retain the asbestos handler supervisor to perform a visual inspection prior to the post-abatement clearance air monitoring to confirm that all containerized waste has been removed from work and holding areas and there is no visible ACM debris or residue on or about all abated surfaces.

**E. ENGINEERING CONTROLS**

1. All asbestos projects shall utilize negative pressure ventilation equipment.
  - a. The asbestos abatement contractor shall use a manometer to document the pressure differential. The asbestos abatement contractor shall install and make the manometer operational once the negative pressure has been established in the work area. Magnahelic manometers shall be calibrated at least every six months and a copy of the current calibration certification shall be available at the work site.
2. Negative pressure ventilation equipment shall be installed and operated to provide at least one air change in the work area every 15 minutes. Where there are no floor or wall barriers because floor or wall material is being abated, there shall be at least one air change in the work area every ten minutes.
3. The negative pressure ventilation equipment shall operate continuously, 24 hours a day, from the establishment of isolation barriers through successful clearance air monitoring. If such equipment shuts off, adjacent areas shall be monitored for asbestos fibers.
4. A static negative air pressure of 0.02 inches (minimum) water column shall be maintained at all times in the work place during abatement to ensure that contaminated air in the Work Area does not filter back to uncontaminated areas.



5. If the contaminated area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors, the cut off switch shall be able to turn off the equipment on all floors.
6. On loss of negative pressure or electric power to the negative pressure ventilating units, abatement shall stop immediately and shall not resume until power is restored and negative pressure ventilation equipment is operating again.
7. Negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas.
  - a. All openings (including but not limited to operable windows, doors, vents, air intakes or exhausts of any mechanical devices) less than 15 feet from the exterior exhaust duct termination location shall be plasticized with two layers of fire retardant 6-mil polyethylene sheeting, or a second negative pressure ventilation unit with the primary unit's capacity shall be connected in series prior to exhausting to the outside.
  - b. Negative pressure ventilation equipment shall exhaust away from areas accessible to the public.
  - c. All ducting shall be sealed and braced or supported to maintain airtight joints. Ducts shall be reinforced and shall be installed so as to prevent breakage. Damage to ducts must be repaired immediately.
8. Where ducting to the outside is not possible, a second negative pressure ventilation unit compatible with the primary unit's capacity shall be connected in series. The area receiving the exhaust shall have sufficient, non-recycling exhaust capacity to the outside of the structure.
9. In the event that there is a failure of the containment system or a breach in the Isolation Barriers, all abatement work will cease and the asbestos abatement contractor will immediately correct the condition. Abatement work will not resume until the Work Area has been smoke tested by the third party laboratory and approved by the Construction Project Manager.

#### **F. LOCKDOWN ENCAPSULATION PROCEDURES**



1. The following procedures shall be followed to seal in non-visible residue while conducting lockdown encapsulation on all surfaces from which ACM has not been removed:
  - a. Only encapsulants rated as acceptable or marginally acceptable on the basis of Battelle Columbus Laboratory test procedures and rating requirements developed under the 1978 USEPA Contract shall be used for lockdown encapsulation.
  - b. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon unless reviewed and approved by DEP.
  - c. Latex paint with solids content greater than 15 percent shall be considered a lockdown sealant for coating all non-metallic surfaces.
  - d. Encapsulants shall be applied using airless spray equipment. Spraying is to occur at the lowest pressure range possible to minimize fiber release from encapsulant impact at the surface. It shall be applied with a consistent horizontal or vertical motion.
  - e. The cleaned layer of the surface barriers shall be removed from walls and floors.

The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

#### **1.07 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS, AND POSTERS**

- A. The asbestos abatement contractor shall submit an Asbestos Project Notification (ACP-7) to the NYCDEP listing each work area within the building separately one week in advance of the start of work.
- B. The registered design professional shall obtain an asbestos abatement permit authorizing the performance of construction work as required for asbestos projects involving one or more of the following activities:
  1. Obstruction of an exit door leading to an exit stair or the exterior of the building;
  2. Obstruction of an exterior fire escape or access to that fire escape;
  3. Obstruction of a fire-rated corridor leading to an exit door;



4. Removal of handrails in an exit stair or ramp;
  5. Removal or dismantling of any fire alarm system component including any fire alarm-initiating device (e.g., smoke detectors, manual pull station);
  6. Removal or dismantling of any exit sign or any component of the exit lighting system, including photo luminescent exit path markings;
  7. Removal or dismantling of any part of a sprinkler system including piping or sprinkler heads;
  8. Removal or dismantling of any part of a standpipe system including fire pumps or valves;
  9. Removal of any non-load bearing / non-fire-rated wall (greater than 45 square feet or 50 percent of a given wall);
  10. Any plumbing work other than the repair or replacement of plumbing fixtures;
  11. Removal of any fire-resistance rated portions of a wall, ceiling, floor, door, corridor, partition, or structural element enclosure including spray-on fire resistance rated materials;
  12. Removal of any fire damper, smoke damper, fire stopping material, fire blocking, or draft stopping within fire-resistance rated assemblies or within concealed spaces;
  13. Any work that otherwise requires a permit from the DOB (full demolitions, alterations, renovations, modifications or plumbing work).
- C. The asbestos abatement contractor shall provide a floor plan showing the areas of the building under abatement and the location of all fire exits in said areas. It shall be prominently posted in the building lobby or comparable location, along with a notice stating the location within the building of the negative air cutoff switch, if applicable.
- D. When one or more of the activities listed in 1.07 (B) (1-8) and (B)(13) of this specification an asbestos abatement permit is required by DEP. The general contractor is responsible for submitting, a work place safety plan (WPSP) and any other applicable construction documents. These documents must be prepared and sealed by a registered design professional.
- E. A WPSP is not required for projects requiring an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (9-12) of this specification. The



asbestos abatement contractor shall submit, together with the asbestos project notification, all applicable asbestos abatement permit construction documents.

F. The general contractor shall retain a Registered Design Professional to perform the inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required by Chapter 17 of the Building Code, as follows:

1. A final inspection shall be performed by a registered design professional retained by the general contractor after all work authorized by the asbestos abatement permit is completed. The person performing the inspection shall note all failures to comply with the provisions of the Building Code or approved asbestos abatement permit and shall promptly notify the owner in writing. All defects noted in such inspection shall be corrected. The final inspection report shall either:

a. Confirm:

- (1) That the construction work is complete, including the reinstallation or reactivation of any building fire safety or life safety component.
- (2) That any defects previously noted have been corrected.
- (3) That all required inspections were performed.
- (4) That the work is in substantial compliance with the approved asbestos abatement permit construction documents, the Building Code, and other applicable laws and rules.

b. Confirm:

- (1) That the construction work does not return the building (or portion thereof) affected by the abatement project to a condition compliant with the building code and other applicable laws and rules, but that the registered design professional has reviewed an application for asbestos abatement permit construction documents approval that has been approved by the department of buildings, and the subsequent scope of work as approved will, upon completion, render all areas affected by the asbestos project in full compliance with the building code and all applicable laws and rules.



- (2) That any defects previously noted that are not addressed by the subsequent scope of work as approved by the department of buildings, have been corrected.
  - (3) That all required inspections that are not addressed by the subsequent scope of work as approved by the department of buildings were performed.
  - (4) That all completed work pursuant to an asbestos abatement permit is in substantial compliance with the approved asbestos abatement permit construction documents.
- G. The Registered Design Professional shall provide the final inspection reports to be filed with DEP on A-TR1 form. Records of final inspections made by registered design professionals shall be submitted to DDC as part of the close out document package.
- H. Erect bilingual (English-Spanish) warning signs around the work space and at every point of potential entry from the outside and at main entrance to building which can be viewed by the public without obstruction, in accordance with OSHA 29 CFR 1926.1101 (K) (Sign Specifications) and Title 15, Chapter 1 of RCNY. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements.
- I. Provide the required labels for all polyethylene bags and all drums utilized to transport contaminated material to the landfill in accordance with OSHA 29 CFR 1926.1101 (K)(2) and by 49 CFR Parts 171 and 172 of the Department of Transportation regulations.
- J. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, NIOSH, State of New York and New York City and any additional items mandated for posting by the aforementioned regulations.
- K. Furnish all permits, variances and notices required to perform the Work.

#### **1.08 EMERGENCY PRECAUTIONS**

- A. Establish emergency and fire exits from the Work Area. The clean side of all emergency exits shall be equipped with two full sets of protective clothing and respirators at all times.



- B. Notify local medical emergency personnel, both ambulance crews and hospital emergency room staff prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workmen.
- C. Prepare to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated immediately for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e., misting of the air with water) until the injured person has been removed from the Work Area.
- D. Notify, before actual removal of the asbestos material, the local police and fire departments to the danger of entering the Work Area. Asbestos abatement contractor shall make every effort to help these agencies form plans of action should their personnel need to enter the contaminated area.

#### **1.09 SUBMITTALS**

##### **A. Pre-Construction Submittals:**

- 1. Attend a pre-construction meeting scheduled by the Department. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items, bound and indexed. The detailed plan of action must be submitted at least five (5) days prior to the pre-construction meeting.
  - a. Asbestos abatement contractor's scope of work, work plan and schedule.
  - b. Asbestos project notifications, approved variances and plans to Government Agencies.
  - c. Copies of Permits, clearance and licenses if required.
  - d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:
    - (1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of



refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

- (2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.
  - (3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.
  - (4) A schedule of equipment to be used including numbers and types of all major equipment such as HEPA Air Filtration Units, HEPA-vacuums, airless sprayers, Water Atomizing Devices and Type "C" compressors.
- e. A written plan and shop drawings for preparation of work site and decontamination chamber.
  - f. Description of protective clothing and approved respirator to be used, make, model, NIOSH approval numbers.
  - g. Delineation of responsibility of work site supervision, including competent person, with names, resumes, and home telephone numbers.
  - h. Explanation of decontamination sequence and isolation techniques.
  - i. Description of specific equipment to be utilized, including make and model number of air filtration devices, vacuums, sprayers, etc.
  - j. Description of any prepared methods, procedures, techniques, or equipment other than those specified in the Contract Documents.
  - k. Explanation of the handling of asbestos contaminated wastes including EPA and NYCDEC identification numbers of Waste Hauler.
  - l. Description of the final clean-up procedures to be used.
  - m. Name and qualifications of asbestos abatement contractor's Air Monitor including AIHA accreditation, and proof of NIOSH PAT and NIST/NVLAP Bulk Quality Assurance Proficiency of OSHA samples for approval by the City of New York Department of Design and Construction.

- n. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.
- o. Safety Data Sheets (SDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until SDS are reviewed.
- p. Worker Training and Medical Surveillance: Asbestos abatement contractor shall submit a list of the NYSDOL and NYCDEP Asbestos supervisors and handlers who will work on this project. Present evidence that workers have received proper training required by the regulations and required by OSHA 29 CFR 1926.1101 (Asbestos Standard) and 1926.1200 (HAZCOM standard) and any other standards applicable to the work.
- q. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.
  - (1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain all information specified in ICR56-3.4 (a)(2)(i).
  - (2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit a copy of the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.
  - (3) Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

**B. During Construction Submittals:**



Submit copies of the following items to the Construction Project Manager during the work:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.
3. Floor plans indicating asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager at weekly progress meetings.
4. All asbestos abatement contractors' air monitoring and inspection results.

**C. Project Closeout Submittals:**

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, Sub-asbestos abatement contractors and Suppliers,
2. Daily OSHA air monitoring results,
3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,
4. Field Sign-In/Sign-Out Logs for every shift,
5. Copies of all Building Department Forms and Permits,
6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,
7. All Warranties as stated in the Specifications,
  - a. Fully executed disposal certificates and transportation manifest.
8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the



project, the project record shall be maintained by the building owner. The project record shall consist of:

- a. Copies of licenses of all asbestos abatement contractors involved in the project;
  - b. Copies of DEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;
  - c. Copies of all project notifications and reports filed with DEP, NYSDOL and EPA for the project, with any amendments or variances;
  - d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;
  - e. A copy of the air sampling log and all air sampling results;
  - f. A copy of the abatement asbestos abatement contractor's daily log book;
  - g. All data related to bulk sampling including the results of any asbestos surveys performed by an asbestos investigator;
  - h. Copies of all asbestos waste manifests;
  - i. A copy of all Project Monitor's Reports (ACP-15).
  - j. A copy of each ATR-1 Form completed for the asbestos project (if required).
  - k. A copy of each Asbestos Project Conditional Closeout Report (ACP-20).
  - l. A copy of the Asbestos Project Completion Form (ACP-21).
  - m. A copy of the project record shall be submitted to DDC and its Third Party Air Monitor within 48 hours of the Issuance of the ACP-21 form, as part of the close out documents.
9. The asbestos abatement contractor shall submit one of the following certifications to the general contractor, with a copy provided to DDC:
- a. Asbestos Project Completion Form. If an asbestos project has been performed, a copy of the asbestos project completion form issued by DEP shall be submitted to DOB, with a copy being provided to



DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

- b. An Asbestos Project Conditional Close-out Form. If an asbestos project has been performed a copy of the asbestos project conditional close-out form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

#### **1.10 QUALITY ASSURANCE**

- A. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industrial standards. All workmanship or work methods are subject to review and acceptance by the Construction Project Manager. Throughout the Specification, reference is made to codes and standards which establish qualities, levels or types of workmanship which will be considered acceptable. It is the asbestos abatement contractor's responsibility to comply with these codes and standards during the execution of this work.
- B. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval to the DDC project manager as part of the asbestos abatement contractor's "Shop Drawings".
- C. It is the asbestos abatement contractor's responsibility, when so required by the Specification or upon written request from the Commissioner or his representative to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose by DDC.
- D. The asbestos abatement contractor shall furnish proof that employees working under his supervision have had instruction on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA regulations. This proof shall be in the form of a notarized affidavit to the effect that the above requirements have been satisfied and a copy of the Job Hazard Analysis (JHA) with tool box meeting executed meeting sign in sheet.



- E. The asbestos abatement contractor will have posted and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos Standard, and 29 CFR 1926.59 Hazard Communication Standard Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. One copy of NYC Title 15, Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.
- F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the asbestos abatement contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.
- G. Rejection of Non-Complying Items: The Commissioner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. The Commissioner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount as approved by the City.
- H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:
1. American National Standards Institute (ANSI)  
(Successor to USASI and ASA)  
25 West 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
  4. National Electrical Code (NEC)  
See NFPA
  5. National Fire Protection Association (NFPA)  
1 Batterymarch Park  
Quincy, Massachusetts 02169-7471



**Department of  
Design and  
Construction**

FMS No. - S136-383S  
Issue Date - 09/20/2018

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
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.
- G. Asbestos abatement contractor shall provide a plan for 24 hour job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas, as required by the Department.



- H. Asbestos abatement contractor shall provide surveillance by a fire watch and set forth procedures to be taken for the safety of building occupants in the event of an emergency, in accordance with the WPSP and DEP regulations.
- I. Should the failure of any utility occur, the City will not be responsible to the asbestos abatement contractor for loss of time or any other expense incurred.
- J. Facility will be responsible to notify the asbestos abatement contractor of any planned electrical power shutdowns in order to ensure that there are no power interruptions in the negative air pressure systems.
- K. Asbestos abatement contractor shall remove all flammable materials from the work area and all sources of ignition (including but not limited to pilot lights) shall be extinguished.
- L. Asbestos abatement contractor shall require a competent person (as defined in OSHA 1926.1101) to perform the following functions and to be on-site continuously for the duration of the project:
  - 1. Monitor the set up of the Work Area enclosure and ensure its integrity.
  - 2. Control entry and exit into the work enclosure.
  - 3. Ensure that employees are adequately trained in the use of engineering controls, proper work practices, proper personal protective equipment and in decontamination procedures.
  - 4. Ensure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.
  - 5. The competent person (as defined in OSHA1926.1101) shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

#### **1.12 USE OF BUILDING FACILITIES**

- A. City shall make available to the asbestos abatement contractor, from existing outlets and supplies, all reasonably required amounts of water and electric power at no charge.



- B. Electric power to all Work Areas shall be shut down and locked out except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided by asbestos abatement contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. The Facility will identify all electric lines that must remain in service. Asbestos abatement contractor shall protect all lines.
- C. Asbestos abatement contractor shall provide, at his own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, asbestos abatement contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Asbestos abatement contractor shall ensure positive shutoff of all water to Work Area during non-working hours.
- D. Utilities:
1. General:  
All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting the work at any site; specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.
  2. Water:  
The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the asbestos abatement contractor.
  3. Electricity:  
The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work.

In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made



through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

A dedicated power supply for the negative pressure ventilating units shall be utilized. The negative air equipment shall be on a ground fault circuit interrupter (GFCI) protected circuit separate from the remainder of the work area temporary power circuits.

- E. Asbestos abatement contractor shall shut down and lock out all electric power to all work areas except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided in accordance with all applicable codes. Existing light sources (e.g., house lights) shall not be utilized. All power to work areas shall be brought in from outside the area through ground-fault circuit interrupter at the source.
1. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:
    - a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.
    - b. Any energized circuits remaining in the work area shall be posted with a minimum two (2) inch high lettering warning sign which reads: DANGER LIVE ELECTRICAL - KEEP CLEAR. A sign shall be placed on all live covered barriers at a maximum of ten (10) foot intervals. These signs shall be posted in sufficient numbers to warn all persons authorized to enter the work area of the existence of the energized circuits.
  2. Any source of emergency lighting which is temporarily blocked as a result of work place preparation shall be replaced for the duration of the project by battery operated or temporary exit signs, exit lights, or photo luminescent path markings.
- F. Asbestos abatement contractor shall provide a separate temporary electric panel board to power asbestos abatement contractor's equipment. The Facility will



designate an existing electrical source in proximity to the Work Area. Asbestos abatement contractor's licensed electrician shall provide temporary tie-in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. The electric shut down for power panel tie-in will be on off-hours and must be coordinated with the Facility. Asbestos abatement contractor shall provide to the City a specification and drawing outlining his power requirements at the pre-construction meeting.

- G. Additional electrical equipment (i.e., transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the asbestos abatement contractor's expense.
- H. Asbestos abatement contractor shall provide fire protection in accordance with all State and Local fire codes.
- I. Sprinklers, standpipes, and other fire suppression systems shall remain in service and shall not be plasticized.
- J. When temporary service lines are no longer required, they shall be removed by the asbestos abatement contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by asbestos abatement contractor. Senior Stationary Engineer will inspect and test all switches, controls, gauges, etc. and shall submit a list to the Construction Project Manager of any equipment damaged by the asbestos abatement contractor.
- K. Asbestos abatement contractor shall supply hot shower water necessary for use in the decontamination unit.

#### **1.13 USE OF THE PREMISES**

- A. Asbestos abatement contractor shall confine his apparatus, the storage of materials, and supplies, and the operation of his workmen to limits established by law, ordinances, and the directions of the Construction Project Manager and the Facility. All flammable or combustible materials shall be properly stored to obviate fire and in areas approved by the Facility.
- B. Asbestos abatement contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that Work Areas are kept neat, clean, and safe.
- C. Asbestos abatement contractor shall maintain exits from the work area or alternative exits shall be established, in accordance with section 1027 of the New



York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.

- D. If the openings of temporary structural partitions related to abatement work areas block egress, the partition shall consist of two sheets of fire retardant 6-mil plastic, prominently marked as an exit with photo luminescent paint or signage. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress.
- E. All surrounding work, fixtures, soil lines, drains, water lines, gas pipes, electrical conduit, wires, utilities, duct work railings, shrubbery, landscaping, etc. which are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the City, at no additional cost.
- F. All routes through the building to be used by the asbestos abatement contractor shall first be approved by the Construction Project Manager and the Facility.
- G. Attention is specifically drawn to the fact that other asbestos abatement contractors, performing the work of other Contracts, may be (or are) brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other asbestos abatement contractors who may be on (or are on) any site of the work of this Contract. Regulated area exempted.
- H. Temporary toilet facilities must be provided by the asbestos abatement contractor on the site. Coordinate location of facilities with Construction Project Manager. No toilet facilities will be allowed in the Work Area.

#### **1.14 PROTECTION AND DAMAGE**

- A. The asbestos abatement contractor is responsible to cover all furniture and equipment that cannot be removed from Work Areas. Moveable furniture and equipment will be removed from Work Areas by asbestos abatement contractor prior to start of work and returned upon successful completion of the final air testing. At the conclusion of the work (after clearance level of air testing reaches the acceptable limit), the asbestos abatement contractor will remove all plastic covering from the walls, floors, furniture, equipment and reinstall furniture and equipment in the cleaned Work Area. The asbestos abatement contractor shall remove all shades, curtains and drapes from the Work Area, and reinstall the same following the final clean up.
- B. Prior to plasticizing, the proposed work areas shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning methods. Methods that raise dust, such as sweeping or vacuuming with equipment not equipped with HEPA filters, are prohibited.



- C. Use rubber tired vehicles that use non-volatile fuels for conveying material inside building and provide temporary covering, as necessary, to protect floors.
- D. No materials or debris shall be thrown from windows or doors of the building. Building waste management system shall NOT be used to remove any asbestos waste from the building.
- E. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited bag storage may take place within the Work Area when approved by the Construction Project Manager.
- F. Protect floors and walls along removal routes from damage, wear and staining with contamination control flooring. All finished surfaces to be protected with Masonite or other rigid sheathing material.
- G. A preliminary inspection for pre-existing damage shall be conducted by asbestos abatement contractor and representative of the City before commencement of the project.

#### **1.15 RESPIRATORY PROTECTION REQUIREMENTS**

- A. Respiratory protection shall be worn by all individuals who may be exposed to asbestos fibers from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring in accordance with Regulations and these Specifications.
- B. Asbestos abatement contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134, at a minimum.
- C. The Asbestos abatement contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein.
- D. Where respirators with disposable filter parts are employed, the asbestos abatement contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.



- E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by asbestos abatement contractor, and used by workers in conjunction with the written respiratory protection program.
- F. Asbestos abatement contractor shall provide respirators selected by an Industrial Hygienist that meet the following requirements:

Table 1. -- Assigned Protection 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

<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).

G. Selection of high efficiency filters:

- 1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.
- 2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.
  - a. N-series filters shall only be used for non-oil solid and water based aerosols or fumes.
  - b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.



- c. Follow filter manufacture recommendations.
- 3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.
- H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the asbestos abatement contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. Documentation of aforementioned results may be requested by the City and/or Third-Party Air Monitor for review. This will not relieve the asbestos abatement contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.
- I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted, and reviewed by the Construction Project Manager. If the TWA and excursion limit have not been conducted, a Supplied-Air Respirator (SAR) or Airline Respirator or Self-Contained Breathing Apparatus (SCBA) must be used. Use of single use dust respirators is prohibited for the above respiratory protection.
- J. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.
- K. Asbestos abatement contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.
- L. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.
- M. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.
- N. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the asbestos abatement contractor at the asbestos abatement contractor's expense.
- O. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:



1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and
  2. High efficiency filters for negative pressure respirators shall be changed after each shower; and
  3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.
  4. Airline respirators with high efficiency filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and
  5. Respirators shall be stored in a dry place and in such a manner that the face-piece and exhalation valves are not distorted; and
  6. Organic solvents shall not be used for washing of respirators.
- P. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

#### **1.16 PROTECTIVE CLOTHING**

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.
- B. In addition to personal protective equipment for workers, the asbestos abatement contractor shall make available at each worksite at least four (4) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager. In addition to respiratory masks for workers, the asbestos abatement contractor must have on hand at the beginning of each work day, at least four (4) masks each with three sets of fresh filters, for use by personnel who are authorized to inspect the worksite and are medically qualified to don a respirator. The asbestos abatement contractor shall check for proper fit of the respirators of all City personnel authorized to enter the Work Area.



- C. Asbestos handlers involved in tent procedures shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. All street clothes shall be removed and stored in a clean room within the work site. The double layer personal protective equipment shall be used for installation of the tent and throughout the procedure, if a decontamination unit (with shower and clean room) is contiguous to the Work Area, only one (1) layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.
- D. The outer disposable suit (if 2 suits are worn) shall be removed and remain in the tent upon exiting. Following the tent disposal and work site clean up the workers shall immediately proceed to a shower at the work site. The inner disposal unit and respirator shall be removed in the shower after appropriate wetting. The disposal clothing shall be disposed of as asbestos-containing waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean dry towels.
- E. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.
- F. Boots: provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated with ACM and/or dust.
- G. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Label all hats with same warning label as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work.
- H. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.
- I. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as asbestos contaminated waste at the end of the work. Gloves shall be worn at all times, except during Work Area Preparation activities that do not disturb ACM.
- J. Reusable footwear, hard hats and eye protection devices shall be left in the contaminated Equipment Room until the end of the Asbestos Abatement Work.



- K. Disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facility.
- L. Adequate supplies of disposable coveralls, head covers and foot covers shall be maintained by the asbestos abatement contractor for authorized representatives who may inspect the Work Area.

#### **1.17 AIR MONITORING - ASBESTOS ABATEMENT CONTRACTOR**

- A. Asbestos abatement contractor shall employ a qualified industrial hygiene firm to conduct OSHA personal exposure monitoring air samples in accordance with OSHA Regulations, 1926.1101 (Asbestos Standards for Construction) to establish representative full shift monitoring data, per task, to determine respiratory protection. The asbestos abatement contractor may submit representative Personal exposure monitoring data for a project of similar size and complexity in lieu of performing monitoring in accordance with OSHA 29CFR 1926.1101.
- B. The asbestos abatement contractor shall ensure that a qualified industrial hygiene laboratory for OSHA personal exposure monitoring is utilized. Such laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).
- C. Sampling and analysis methods shall be per NIOSH 7400A.
- D. Test Reports:
  - 1. Promptly process and distribute one copy of the test results, to the Commissioner via email.
  - 2. Prompt reports are necessary so that if required, modifications to work methods and/or practices may be implemented as soon as possible.
  - 3. Asbestos abatement contractor shall post the personal exposure monitoring results at the jobsite within 24 hours of receipt of the results.
- E. Competent person shall conduct inspections and provide written reports daily. Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project which may affect the health and safety of the people and environment.



- F. All costs for required the asbestos abatement contractor's air monitoring shall be borne by the asbestos abatement contractor.
- G. The City reserves the right to conduct air and surface dust sampling in conjunction with and separate from the Third-Party Air Monitor for the purposes of Quality Assurance.

**1.18 THIRD PARTY MONITORING AND LABORATORY**

- A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.
- B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM). This laboratory shall meet the standards stated in Paragraph 1.17. B.
- C. Observations will include, but not be limited to, checking the standard operating procedures, engineering control systems, respiratory protection, decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the environment, Asbestos abatement contractor, and/or facility occupants.
- D. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.
- E. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.
- F. At a minimum, air sampling shall be conducted in accordance with the following schedule:

Abatement Activity	Pre-Abatement	During Abatement	Post- Abatement
Equal to or greater than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	TEM
Less than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	PCM

Note: TEM is acceptable wherever PCM is required.



G. The number of air samples required per stage of abatement and size of abatement project is listed in the table below:

		Pre-Abatement	During Abatement	Post Abatement
<b>Large Asbestos Projects</b>				
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>
<b>Small Asbestos Projects</b>				
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>
<b>Minor Projects</b>				
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>

<sup>a</sup>if more than three (3) tents then two (2) samples required per enclosure.

<sup>b</sup>if more than three (3) tents then one (1) sample required per enclosure.

<sup>c</sup>samples shall be taken within the work area(s).

<sup>d</sup>area sampling is required only if:

- visible emissions are detected during the project
- during-abatement area sampling results exceeded 0.01 f/cc or the pre-abatement area sampling result(s) for interior projects where applicable.
- work area to be reoccupied is an interior space at a school, healthcare, or daycare facility.

H. Prior to commencement of abatement activities, the Third Party Air Monitoring Firm will collect a minimum number of area samples inside each homogeneous work area.

1. Samples will be taken during normal occupancy activities and circumstances at the work site.
2. Samplers shall be located within the proposed work area and at all proposed isolation barrier locations.
3. Samples shall be analyzed using PCM.
4. The number of samples to be collected will be determined by the size of the project and the abatement methods to be utilized.



- I. Frequency and duration of the air sampling during abatement shall be representative of the actual conditions during the abatement. The size of the asbestos project will be a factor in the number of samples required to monitor the abatement activities. The following minimum schedule of samples shall be required daily.
  1. For large asbestos projects employing full containment, area air sampling shall be performed at the following locations:
    - a. Two area samples outside the work area in uncontaminated areas of the building, remote from the decontamination facilities.
      - (1) Primary location selection shall be within 10 feet of isolation barriers.
      - (2) Where negative ventilation exhaust runs through uncontaminated building areas, one of the area samples will be required in these areas to monitor any potential fiber release.
      - (3) Where exhaust tubes have been grouped together in banks of up to five (5) tubes, with each tube exhausting separately and the bank of tubes terminating together at the same controlled area, one area air sample shall be taken.
    - b. One area sample within the uncontaminated entrance to each decontamination enclosure system.
    - c. Where adjacent non-work areas do not exist, an exterior area sample shall be taken.
    - d. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct.
    - e. One area sample outside, but within 25 feet of, the building or structure, if the entire building or structure is the work area.
  2. For large asbestos projects involving interior foam method, area air sampling shall be performed at the following sampling locations:
    - a. One area sample taken outside the work area within 10 feet of isolation barriers.
    - b. One area sample taken within the uncontaminated entrance to each worker decontamination and waste decontamination enclosure system.



- c. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct, if applicable.
  - d. Three area samples inside the work area.
  - e. One area sample where the negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
3. For large asbestos projects employing the glovebag procedure within a tent, a minimum of five continuous air samples shall be taken concurrently with the abatement for each work area, unless there are more than three enclosures, in which case two area samples per enclosure are required.
  - a. Four area samples taken outside the work area within ten feet of tent enclosure(s).
  - b. One area sample taken within the uncontaminated entrance to each worker and waste decontamination enclosure system.
  - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
  - d. One area sample where negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.
4. For large asbestos projects involving exterior foam method or removal of ACM from vertical surfaces, a minimum of five continuous area samples shall be taken concurrently with the abatement for each work area using the following minimum requirements:
  - a. Three area samples inside the work area and remote from the decontamination systems.
  - b. One area sample within the uncontaminated entrance to each worker and waste decontamination enclosure system.
  - c. One area sample outside the work area within 25 feet of the building or structure, if the entire building or structure is the work area.
  - d. One area sample inside the building or structure at the egress point to the work area, if applicable.
5. For small asbestos projects employing full containment, a minimum of three



continuous area samples shall be taken concurrently with the abatement for each work area at the following locations:

- a. Two area samples taken outside the work area within ten feet of the isolation barriers.
  - b. One area sample within the uncontaminated entrance to each worker or waste decontamination enclosure system.
  - c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.
  - d. One area sample where negative ventilation exhaust ducting runs through an uncontaminated building area, if applicable.
6. Tent Procedures:  
For projects involving more than 25 linear feet or 10 square feet, a minimum of three continuous samples shall be taken concurrently throughout abatement.
- J. Post-abatement clearance air monitoring for projects not solely employing glove-bag procedures shall include a minimum number of area samples inside each homogeneous work area and outside each homogeneous work area (five samples inside/five samples outside for Large Projects and three samples inside/three samples outside for Small Projects). In addition to the five sample inside/five sample outside minimum for Large Projects, one additional representative area sample shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.
- K. Post-abatement clearance air monitoring for Small Projects solely employing glove-bag procedures is not required unless one or more of the following events occurs. In such cases, post-abatement clearance air monitoring procedures shall be followed. The events requiring post-abatement clearance air monitoring are:
1. The integrity of the glove-bag was compromised,
  2. Visible emissions are detected outside the glove-bag, and/or
  3. Ambient levels exceed 0.01 f/cc during abatement.
- L. Monitoring requirements for other than post-abatement clearance air monitoring are as follows:
1. The sampling zone for indoor air samples shall be representative of the building occupants' breathing zone.



2. If possible, outdoor ambient and baseline samplers should be placed about 6 feet above the ground surface in reasonable proximity to the building and away from obstructions and drafts that may unduly affect airflow.
  3. For outdoor samples, if access to electricity and concerns about security dictate a rooftop site, locations near vents and other structures on the roof that would unduly affect airflow shall be avoided.
  4. Air sampling equipment shall not be placed in corners of rooms or near obstructions such as furniture.
  5. Samples shall have a chain of custody record.
- M. Post-abatement clearance air monitoring requirements are as follows:
1. Sampling shall not begin until at least one hour after wet cleaning has been completed and no visible pools of water or condensation remain.
  2. Samplers shall be placed at random around the work area. If the work area contains the number of rooms equivalent to the number of required samples based on floor area, a sampler shall be placed in each room. When the number of rooms is greater than the required number of samples, a representative sample of rooms shall be selected.
  3. The representative samplers placed outside the work area but within the building shall be located to avoid any air that might escape through the isolation barriers and shall be approximately 50 feet from the entrance to the work area, and 25 feet from the isolation barriers.
- N. The following aggressive sampling procedures shall be used within the work area during all clearance air monitoring:
1. Before starting the sampling pumps, use forced air equipment (such as a one horsepower leaf blower) to direct exhaust air against all walls, ceilings, floors, ledges and other surfaces in the work area. This pre-sampling procedure shall take at least five minutes per 1,000 square feet of floor area; then
  2. Place a 20-inch diameter fan in the center of the room. Use one fan per 10,000 cubic feet of room space. Place the fan on slow speed and point it toward the ceiling.
  3. Start the sampling pumps and sample for the required time or volume.
  4. Turn off the pump and then the fan(s) when sampling is completed.

5. Collect a minimum number of area samples inside and outside each homogeneous work area (five inside/five outside samples for Large Projects and three inside/three outside samples for Small Projects). In addition to the minimum for Large Projects, one representative area samples shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.

- O. For post-abatement monitoring, area samples shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM	1,800 liters	5 to 15 liters/minute
TEM	1,250 liters	1 to 10 liters/minute

1. Each homogeneous work area that does not meet the clearance criteria shall be thoroughly re-cleaned using wet methods, with the negative pressure ventilation system in operation. New samples shall be collected in the work area as described above. The process shall be repeated until the work site meets the clearance criteria.
2. For an asbestos project with more than one homogeneous work area, the release criterion shall be applied independently to each work area.
3. Should airborne fiber concentrations exceed the clearance criteria, the asbestos abatement contractor shall re-clean the work area utilizing wet wiping and HEPA-vacuuming techniques. Following completion of re-cleaning activities, the Third-Party Air Monitor will perform an observation of the Work Area. If the Third-Party Air Monitor determines that the work was performed in accordance with the specifications, the appropriate settling period will be observed and additional air sampling will be performed.
4. All costs resulting from additional air tests and observations shall be borne by the asbestos abatement contractor. These costs may include, but are not limited to, labor, analysis fees, materials, and expenses.
5. After the area has been found to be in compliance, the asbestos abatement contractor may remove Isolation Barriers and perform final cleaning as specified.

- P. Clearance and/or Re-occupancy Criteria:

1. The clearance criteria shall be applied to each homogeneous work area independently.



2. For PCM analysis, the clearance air monitoring shall be considered satisfactory when each of the 5 inside/5 outside samples for Large Projects and/or 3 inside/3 outside samples for Small Projects is less than or equal to 0.01 f/cc or the background concentrations, whichever is greater.
3. For TEM analysis, the clearance air monitoring shall be considered satisfactory when the requirements stated in 40 CFR Part 763, Subpart E, Appendix A, Section IV are met.
4. As soon as the air monitoring tests are completed and analyzed, the Third-Party Air Monitor will send the results of such tests to the City and notify the Asbestos abatement contractor.
5. The asbestos abatement contractor shall initiate the appropriate closeout process in DEP ARTS within 24 hours of the Re-occupancy letter being issued by the Third-Party Air Monitoring Firm. This will allow the Third-Party Air Monitoring Firm to complete and submit the ACP-15 forms for each specific work area.
6. The asbestos abatement contractor shall provide the ACP-20 and ACP-21 forms to the general contractor within 48 hours of receipt by DEP.

#### **1.19 TAMPERING WITH TEST EQUIPMENT**

All parties to this Contract are hereby notified that any tampering with testing equipment will be considered an attempt at falsifying reports and records to federal and state agencies and each offense will be prosecuted under applicable state and federal criminal codes to the fullest extent possible.

#### **1.20 GUARANTEE**

- A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the City.
- B. The asbestos abatement contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the Commissioner.
- C. The City will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

### **PART 2 – PRODUCTS**

#### **2.01 MATERIAL HANDLING**



- A. Deliver all materials to the job site in their manufacturer's original container, with the manufacturer's label intact and legible.
  - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  - 2. Store all materials on pallets, away from any damp and/or wet surface. Cover materials in order to prevent damage and/or contamination.
  - 3. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.
- B. The Construction Project Manager may reject as non-complying such material and products that do not bear identification satisfactory to the Construction Project Manager as to manufacturer, grade, quality and other pertinent information.

## **2.02 MATERIALS**

- A. Wetting agents: (Surfactant) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.
- B. Encapsulants: Liquid material which can be applied to asbestos-containing material which temporarily controls the possible release of asbestos fibers from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.
- C. During abatement activities, replacement materials shall be stored outside the work area in a manner to prevent contamination. Materials required for the asbestos project (i.e., plastic sheeting, replacement filters, duct tape, etc.) shall be stored to prevent damage or contamination.
- D. Framing Materials and Doors: As required to construct temporary decontamination facilities and isolation barriers. Lumber shall be high grade, new, finished one side and fire retardant.
- E. Fire Retardant Polyethylene Sheeting: minimum uniform thickness of 6-mil. Provide largest size possible to minimize seams. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.



- F. Fire Retardant Reinforced Polyethylene Sheeting: For covering floor of decontamination units, provide translucent, nylon reinforced or woven polyethylene laminated, fire retardant polyethylene sheeting. Provide largest size possible to minimize seams, minimum uniform thickness 6-mil. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.
- G. Drums: Asbestos-transporting drums, sealable and clearly marked with warning labels as required by OSHA and EPA.
- H. Polyethylene Disposal Bags: Asbestos disposal bags, minimum of fire retardant 6-mil thick. Bags shall be clearly marked with warning labels as required by OSHA and EPA.
- I. Signs: Asbestos warning signs for posting at perimeter of Work Area, as required by OSHA and EPA.
- J. Waste Container Bag Liners and Flexible Trailer Trays: One piece leak-resistant flexible tray with absorbent pad.
- K. Tape: Provide tape which is of high quality with an adhesive that is formulated to aggressively stick to sheet polyethylene.
- L. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- M. Flexible Duct: Spiral reinforced flex duct for air filtration devices.
- N. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high boot-type foot covers. Protective clothing shall conform to OSHA Standard 29 CFR 1926.1101.
- O. Surfactants, strippers, sealers, or any other chemicals used shall be non-carcinogenic and non-toxic.
- P. Materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

## **2.03 TOOLS AND EQUIPMENT**

- A. Air Filtration Device (AFD): AFDs shall be equipped with High Efficiency Particulate Air (HEPA) filtration systems and shall be approved by and listed with Underwriter's Laboratory.
- B. Scaffolding: All scaffolding shall be designed and constructed in accordance with



OSHA (29 CFR 1926/1910), New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. All scaffolding and components shall be capable of supporting without failure a minimum of four times the maximum intended load, plus an allowance for impact. All scaffolding and staging must be certified in writing by a Professional Engineer licensed to practice in the State of New York.

1. Equip rungs of all metal ladders, etc., with an abrasive, non-slip surface.
  2. Provide non-skid surface on all scaffold surfaces subject to foot traffic. Scaffold ends and joints shall be sealed with tape to prevent penetration of asbestos fibers.
- C. Transportation Equipment: Transportation Equipment, as required, shall be suitable for loading, temporary storage, transit and unloading of asbestos contaminated waste without exposure to persons or property. Any temporary storage containers positioned outside the building for temporary storage shall be metal, closed and locked.
- D. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems.
- E. Vacuum Attachments: Soft Brush Attachment, Asbestos Scraper Tool, Drill Dust Control Kit.
- F. Electric Sprayer: An electric airless sprayer suitable for application of encapsulating material and shall be approved by and listed with Underwriters Laboratory.
- G. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.
- H. Water Atomizer: Powered air-misting device equipped with a ground fault interrupter and equipped to operate continuously.
- I. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small, fine fibers.
- J. Power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation. Abrasive removal methods, including the use of beadblasters, are prohibited.
- K. Other Tools and Equipment: Asbestos abatement contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, sponges, rounded-edge shovels,



brooms, and carts.

- L. Fans and Leaf Blower: Provide Leaf Blower (one leaf blower per floor) and one 20-inch diameter fans for each 10,000 cubic feet of Work Area volume to be used for aggressive sampling technique for clearance air testing.
- M. Fire Extinguishers: At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.
- N. First Aid Kits: Asbestos abatement contractor shall maintain adequately stocked first aid kits in the clean rooms of the decontamination units and within Work Areas. The first aid kit shall be approved by a licensed physician for the work to be performed under this Contract.
- O. Water Service:
  - 1. Temporary Water Service Connection: All connections to the Facilities water system shall include back flow protection. Valves shall be temperature and pressure rated for operation of the temperature and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping, and equipment. Leaking or dripping fittings/valves shall be repaired and or replaced as required.
  - 2. Water Hoses: Employ new heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each Work Area and to each Decontamination Enclosure Unit. Provide fittings as required for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.
  - 3. Water Heater: Provide UL rated 40-gallon electric water heaters to supply hot water for Personal Decontamination Enclosure System Shower. Activate from 30 Amp Circuit breakers located within the Decontamination Enclosure sub panel. Provide relief valve compatible with water heater operations, pipe relief valve down to drip pan at floor level with type 'L' copper piping. Drip pans shall be 6-inch deep and securely fastened to water heater. Wiring of the water heater shall comply with NEMA, NECA, and UL standards.
- P. Electrical Service:
  - 1. General: Comply with applicable NEMA, NEC and UL standards and governing regulations for materials and layout of temporary electric service.



2. **Temporary Power:** Provide service to decontamination unit sub panel with minimum 60 AMP, two pole circuit breaker or fused disconnect connected to the building's main distribution panel. Sub panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.
3. **Voltage Differences:** Provide identification warning signs at power outlets that are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
4. **Ground Fault Protection:** Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate the GFCIs outside the Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in Work Area, decontamination units, exterior, or as otherwise required by NECA, OSHA or other authority.
5. **Power Distribution System:** Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.
6. **Temporary Wiring:** In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.
7. **Electrical Power Cords:** Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.
8. **Temporary Lighting:** All lighting within the Work Area shall be liquid and moisture proof and designed for the use intended.
  - a. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
  - b. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.
9. If electrical circuits, machinery, and other electrical systems in or passing through the work area must stay in operation due to health and safety requirements, the following precautions must be taken:



- a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

## 2.04 CLEANING

- A. Throughout the construction period, the asbestos abatement contractor shall maintain the building as described in this Section.

1. The asbestos abatement contractor shall prevent building areas other than the Work Area from becoming contaminated with asbestos-containing dust or debris. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement contractor's work practices, the asbestos abatement contractor shall be responsible for cleaning these areas in accordance with the procedures appended in Title 15, Chapter 1 of RCNY and NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the asbestos abatement contractor at no additional cost to the City.
2. The asbestos abatement contractor shall provide to all personnel and laborers the required equipment and materials needed to maintain the specified standard of cleanliness.

- B. General

1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is on operation to remove asbestos fibers.
2. Asbestos wastes shall be double bagged in six mil fire retardant polyethylene bags approved for ACM disposal and shall be properly labeled and handled before disposal.
3. All waste generated shall be bagged, wrapped or containerized immediately upon removal. The personal and waste decontamination enclosure systems and floor and scaffold surfaces shall be HEPA vacuumed and wet cleaned at the end of each work shift at a minimum.
4. The asbestos abatement contractor shall use corrugated cartons or drums for disposal of asbestos-containing waste having sharp edged components (e.g.,



- nails, screws, metal lathe and tin sheeting) that may tear polyethylene bags and sheeting. The waste within the drums or cartons must be double bagged.
5. The asbestos abatement contractor shall transport all bags of waste to disposal site in thirty gallon capacity metal or fiber drums with tight lids, or in locked steel dumpster.
  6. Dumping of debris, waste or bagged waste will not be permitted.
  7. The waste decontamination enclosure system shall be wet cleaned twice using wet cleaning methods upon completion of waste removal. When the worker decontamination enclosure shower room alternates as a waste container wash room, the shower room shall be washed immediately with cloths or mops saturated with a detergent solution prior to wet cleaning.
  8. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
  9. ACM shall be collected utilizing rubber dust pans and rubber squeegees.
  10. HEPA vacuums shall not be used on wet materials unless specifically designed for that purpose.
  11. Metal shovels shall not be used within the work area.
  12. Mastic solvent when used will be applied in moderation (e.g., by airless sprayer). Saturation of the concrete floor with mastic solvent must be avoided.
  13. The asbestos abatement contractor shall retain all items in the storage area in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of all materials.
  14. The asbestos abatement contractor shall not allow accumulation of scrap, debris, waste material, and other items not required for use in this work. When asbestos contaminated waste must be kept on the work site overnight or longer, it shall be double bagged and stored in accordance with New York City Department of Sanitation (DSNY) regulation Title 16 Chapter 8, and Federal, State and City laws.
  15. At least twice a week (more if necessary), the asbestos abatement contractor shall completely remove all scrap, debris and waste material from the job site.



16. The asbestos abatement contractor shall provide adequate storage space for all items awaiting removal from the job site, observing all requirements for fire protection and concerns for the environment.
17. All respiratory protection equipment shall be selected from the latest NIOSH Certified Equipment list.
18. Daily and more often, if necessary, the asbestos abatement contractor shall inspect the Work Areas and adjoining spaces, and pick up all scrap, debris, and waste material. All such items shall be removed to the place designated for their storage.
19. Weekly, and more often, if necessary, the asbestos abatement contractor shall inspect all arrangements of materials stored on the site; re-stack and tidy them or otherwise service them to meet the requirements of these Specifications.
20. The asbestos abatement contractor shall maintain the site in a neat and orderly condition at all times.

### **PART 3 – EXECUTION**

#### **3.01 WORKER DECONTAMINATION FACILITY**

**A. Large Asbestos Projects:**

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas
  - a. Structure:
    - (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
    - (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
    - (3) Interior shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The



interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of 12 inches.

- (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into Work Area.
- b. **Curtained Doorways:** A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.
- c. **Air Locks:** Air locks shall consist of two curtained doorways placed a minimum of three feet apart. The curtained doorways shall consist of 3 overlapping sheets of fire retardant 6-mil polyethylene sheeting, with alternating entrances and weighted at the bottom.
- d. **Decontamination Enclosure System** shall be placed adjacent to the Work Area and shall consist of three totally enclosed chambers, separated from Work Area and each other by airlocks, as follows:
  - (1) **Equipment Room:** The equipment room shall have a curtain doorway to separate it from the Work Area, and share a common airlock with the shower room. The equipment room shall be large enough to accommodate at least one worker (allowing them enough room to remove their protective clothing and footwear), and a fire retardant 6-mil disposal bag for collection of discarded clothing and equipment. The equipment room shall be utilized for the storage of equipment and tools after decontamination using a HEPA-vacuum and/or wet cleaning. A one-day supply of replacement filters, in sealed containers, for HEPA-vacuums and negative air machines, extra tools, containers of surfactant, and other materials and equipment required for the project shall be stored here. A walk-off pan filled with water shall be placed in the Work Area just outside the equipment room for persons to clean foot coverings when leaving the Work Area. Contaminated footwear and reusable work clothing shall be stored in this room.
  - (2) **Shower Room:** The shower room shall have two airlocks (one that separates it from the equipment room and one that separates it from the clean room). The shower room shall contain at least one shower, with hot and cold water adjustable



at the tap, per six workers. Careful attention shall be given to the shower to ensure against leaking of any kind and shall contain a rigid catch basin at least six inches deep. Asbestos abatement contractor shall supply towels, shampoo and liquid soap in the shower room at all times. Shower water shall be continuously drained, collected, and filtered through a system with at least a 5-micron particle size collection capacity. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filters by large particles. Pumps shall be installed, maintained and utilized in accordance with manufacturer's recommendations. Filtered water shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste.

- (3) **Clean Room:** The clean room shall share a common airlock with the shower room and shall have a curtained doorway to separate it from outside non-contaminated areas. Lockers, for storage of workers' street clothing, and shelves, for storing respirators, shall be provided in this area. Clean disposable clothing, replacement filters for respirators, and clean dry towels shall be provided in the clean room. The clean room shall not be used for the storage of tools, equipment or other materials.

**B. Small Asbestos Projects:**

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.
2. The worker decontamination enclosure system shall consist of, at a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.
3. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.



- C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

### 3.02 WASTE DECONTAMINATION FACILITY

- A. Large Asbestos Project (Small Project Option)

- 1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.

- a. Structure:

- (1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.
- (2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.
- (3) Interior walls shall be covered with two layers of fire retardant 6-mil polyethylene sheathing, 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 sheathing with a minimum overlap on the walls of 12 inches.
- (4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into the Work Area.

- b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.

- c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart. The curtained doorways shall consist of 3 overlapping sheets of fire retardant 6-mil polyethylene sheathing, with alternating entrances and weighted at the bottom.



d. Decontamination Enclosure System shall be located outside the work area and attached to all locations through which ACM waste will be removed from the work area and shall consist of two totally enclosed chambers, separated from the Work Area and each other by airlocks, as follows:

(1) **Washroom:** An equipment washroom shall have two air locks (one separating the unit from the Work Area and one common air lock that separates it from the holding area). The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the Work Area, prior to moving to the washroom.

B. **Holding Area:** A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door shall be placed at the holding area entrance to prevent unauthorized access into the Work Area.

C. **Small Asbestos Project:**

1. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.

2. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

D. **Decontamination Enclosure System Utilities:** Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

### **3.03 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING REMOTE DECONTAMINATION FACILITIES**

A. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and



shall fully identify the facility, agents, asbestos abatement contractor(s), the project, each Work Area, and worker respiratory protection employed. The asbestos handler supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.

- B. Each worker shall remove street clothes in the clean room; wear two disposable suits, including gloves, hoods and non-skid footwear; and put on a clean respirator (with new filters) before entering the Work Area.
- C. Each worker shall, before leaving the Work Area or tent, clean the outside of the respirators and outer layer of protective clothing by wet cleaning and/or HEPA-vacuuming. The outer disposable suit shall be removed in the airlock prior to proceeding to the Worker Decontamination Unit. The inner disposable suit and respirator shall be wet wiped and HEPA vacuumed thoroughly before removing and prior to aggressive shower.
- D. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately.

**3.04 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR  
REMOVAL OPERATIONS UTILIZING ATTACHED DECONTAMINATION  
FACILITIES**

- A. All workers and authorized visitors shall enter the Work Area through the worker decontamination facility.
- B. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, asbestos abatement contractor(s), the project, each Work Area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.
- C. Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator with filters, and clean protective clothing before entering the Work Area through the shower room and equipment room.



- D. Each worker or authorized visitor shall, each time he leaves the Work Area, remove gross contamination from clothing before leaving the Work Area; proceed to the equipment room and remove clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.
- E. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the Work Area is not permitted outside the Work Area.

### **3.05 MAINTENANCE OF DECONTAMINATION ENCLOSURE FACILITIES AND BARRIERS**

The following procedures shall be followed during abatement activities.

- A. All polyethylene barriers inside the work place and partitions constructed to isolate the Work Area from occupied areas shall be inspected by the asbestos handler supervisor at least twice per shift.
- B. Smoke tubes shall be used to test the integrity of the Work Area barriers and the decontamination enclosure systems daily before abatement activity begins and at the end of each shift.
- C. Damage and defects in the decontamination enclosure system shall be repaired immediately upon discovery. The decontamination enclosure system shall be maintained in a clean and sanitary condition at all times.
- D. At any time during the abatement activity, if visible emissions are observed, or elevated asbestos fiber counts outside the Work Area are measured, or if damage occurs to barriers, abatement shall stop. The source of the contamination shall be located, the integrity of the barriers shall be restored and extended to include the contaminated area, and visible residue shall be cleaned up using appropriate HEPA-vacuuming and wet cleaning.
- E. Inspections and observations shall be documented in the daily project log by the asbestos handler supervisor.
- F. The daily inspection to ensure that exits have been checked against exterior blockage or impediments to exiting shall be documented in the log book. If exits are found to be blocked, abatement activities shall stop until the blockage is cleared.



### 3.06 MODIFICATIONS TO HVAC SYSTEMS

- A. Shut down, isolate or seal, all existing HVAC units, fans, exhaust fans, perimeter convection air units, supply and/or return air ducts, etc., situated in, traversing or servicing the work zone.
  
- B. Seal all seams with duct tape. Wrap entire duct with a minimum of two layers of fire retardant 6-mil polyethylene sheeting. All shutdowns are to be coordinated with the Facility. Where systems must be maintained, i.e., traversing Work Areas to non-Work Areas, only supply ducts will be maintained, protect as described above. All returns must be blanked off in Work Area and adjacent areas, including floor above and below Work Area. When required Asbestos abatement contractor shall apply for a clarification from NYCDEP. The Asbestos abatement contractor shall implement the following engineering procedures:
  - 1. Maintenance of a positive pressure within the HVAC system of 0.01 inch water gauge (or greater) with respect to the ambient pressure outside the Work Area. The conditions for this system shall be maintained and be operational 24 hours per day from the initiation of Work Area preparation until successful final air clearance. Positive pressurization of HVAC system shall be applied only under the direction and control of professional engineer, or other knowledgeable licensed professional;
  - 2. The positive pressurization of the duct shall be tested, inspected and recorded both at the beginning and at the end of each shift;
  - 3. The positive pressurization shall be monitored using instrumentation which will provide a written record of pressurization and that will trigger an audible alarm, if the static pressure falls below the set value;
  - 4. The supply air fan and the supply air damper for the active positive-pressurized duct shall be placed in the manual "on" positions to prevent shutdown by fail-safe mechanisms;

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**SECTION 03 01 30**  
**CONCRETE RESTORATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide labor, materials, equipment, and services to provide for the structural restoration of concrete members with manufactured structural repair concrete/mortar as shown on Drawings and as specified herein. Work includes removing spalled concrete and cleaning and coating of exposed steel reinforcement and application of weather-resistant anti-carbonation coating.

**1.3 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications
1. Installer: Company specializing in the Work of this Section shall have a minimum of three years of experience.
  2. Manufacturer: Company specializing in the manufacture of concrete repair mortars to be used in this Contract shall have a minimum of three years of experience.
- C. Manufacturer's Representative
1. All work of this Section shall be performed under the overall supervision of the repair material manufacturer's representative. The representative shall attend pre-construction meetings to instruct the contractor on the proper usage of the material and to make regular visits during the course of construction to ensure that surface preparation and method of installation is acceptable.
- D. Job Mockups
1. Prior to performing the work of this Section, prepare a sample panel of not less than 12 sq. ft. of concrete restoration work, including a separate mock-up of the surface



preparation and coating. For formed restorations, provide mockup of pour to ensure that material will be properly vibrated and finish will be without voids. Do not proceed further with the work until the Commissioner has approved the sample panel. Sample shall be a portion of the area to be restored and may be kept if approved.

#### 1.4 REFERENCE STANDARDS

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by NYC Building Code, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society of Testing and Materials (ASTM)
2. Steel Structures Painting Council (SSPC)
  - a. "Hand Tool Cleaning - SP2"
  - b. "Power Tool Cleaning - SP3"
3. International Concrete Restoration Institute (ICRI)

#### 1.5 SUBMITTALS

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

B. Product Data

1. Provide manufacturer's information on the anti-corrosion coating and structural repair concrete/mortar, including application instructions and specifications.

C. Quality Control Submittals

1. Certificates:
  - a. Furnish manufacturer's certification that materials meet or exceed Specification requirements.
2. Restoration Procedure: Furnish written description of restoration procedures and operations sequencing based on manufacturer's requirements prior to commencing the Work.



3. Manufacturer's Field Reports: Submit field report from manufacturer of repair mortar indicating areas of surface preparation and mortar placement inspected.
4. Mock-up: Provide mock-ups as indicated under Quality Assurance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Materials specified shall be delivered to the site in sealed, properly labeled containers. Containers shall indicate manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).
- B. Keep containers tightly closed when not in use. Comply with manufacturer's printed instructions for storing and protecting materials.
- C. Do not store liquid material in hot sun. Keep material from freezing.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply if the temperature is below 50°F or above 85°F unless the material manufacturer is consulted for recommendations.
- B. Do not use frozen materials or materials coated with ice or frost.
- C. Do not apply when there is expectation of rain within 24 hours.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

- A. Sto Concrete Restoration Div., Atlanta, GA 30331
- B. Sika Corp, Lyndhurst, NJ 07071
- C. Strongwall Industries, Ridgewood, NJ 07451
- D. KEIM Mineral Coatings of America, Inc.  
Charlotte, North Carolina 28273
- E. or approved equal



2.2 MATERIALS

A. Structural Repair Concrete - Non-formed/overhead Application

1. Shall have non-shrink characteristics and be of high compressive and bond strength. Material shall be non-sag, capable of being troweled in place for vertical and overhead applications without the need of formwork and conform to the following properties:
  - a. Compressive strength of 5000 psi in 28 days when tested in accordance with ASTM C109.
  - b. Bond strength of 2000 psi in 28 days when tested in accordance with ASTM C882 (modified). Results of tests showing failure of base material is acceptable alternative.
  - c. Flexural strength of 1300 psi in 28 days when tested in accordance with ASTM C78 or ASTM C293.
  - d. Maximum linear length change shall be 0.080% when tested in accordance with ASTM C157 (dry cure).
  - e. Modulus of elasticity shall be between 3.0 and 3.5 x 10<sup>6</sup> when tested in accordance with ASTM C469.
2. Repair concrete/mortar shall be "CR702 Sto Overhead Mortar" as manufactured by Sto Concrete Restoration Division, "Sikatop 123 Plus" as manufactured by Sika Corporation, or "SW-88" as manufactured by Strongwall Industries, or approved equal.

B. Structural Repair Concrete/Mortar - Horizontal Application

1. Shall have non-shrink characteristics and be of high compressive and bond strength. Material shall be capable of being poured or troweled in place for horizontal applications and for formed applications of sufficient dimensions to allow for proper placement of material and conform to the following properties:
  - a. Compressive strength of 5000 psi in 28 days when tested in accordance with ASTM C109.
  - b. Bond strength of 2000 psi in 28 days when tested in accordance with ASTM C882 modified). Results of tests showing failure of base material is acceptable alternative.



- c. Flexural strength of 1600 psi in 28 days when tested in accordance with ASTM C78 or ASTM C293.
  - d. Maximum linear length change shall be maximum of 0.08% at 28 days when tested in accordance with ASTM C157.
  - e. Modulus of elasticity shall be between 3.0 and 3.5 x 10<sup>6</sup> when tested in accordance with ASTM C469.
2. Repair concrete/mortar shall be "CR701 Sto Trowel-Grade Mortar" as manufactured by Sto Concrete Restoration Division, "Sikatop 122 Plus" as manufactured by Sika Corporation, or "SW-81/SW-81F" as manufactured by Strongwall Industries, or approved equal.
- C. Structural Repair Concrete/Mortar - Formed Application
1. Shall have non-shrink characteristics and be of high compressive and bond strength. Material shall be flowable, capable of being poured in formed restorations of small dimensions without forming voids and conform to the following properties:
    - a. Compressive strength of 5000 psi in 28 days when tested in accordance with ASTM C109.
    - b. Bond strength of 2000 psi in 28 days when tested in accordance with ASTM C882 modified). Results of tests showing failure of base material is acceptable alternative.
    - c. Flexural strength of 1500 psi in 28 days when tested in accordance with ASTM C78 or ASTM C293.
    - d. Maximum linear length change shall be maximum of 0.08% at 28 days when tested in accordance with ASTM C157.
    - e. Modulus of elasticity shall be between 3.0 and 3.5 x 10<sup>6</sup> when tested in accordance with ASTM C469.
  2. Repair concrete/mortar shall be "CR745 Sto Flowable Mortar" as manufactured by Sto Concrete Restoration Division, "Sikatop 111 Plus" as manufactured by Sika Corporation, or "SW-81F" as manufactured by Strongwall Industries, or approved equal.
- D. Anti-corrosion Coating
1. Corrosion-inhibiting, epoxy/acrylic resin, protective coating for steel reinforcing bars that will not form a vapor barrier or bond break with the repair mortar with the following properties:



- a. Bond strength of 1800 psi in 2 hours when tested in accordance with ASTM C882.
  - b. Flexural strength of 2000 psi in 28 days when tested in accordance with ASTM C78.
  - c. Tensile strength of 800 psi in 28 days when tested in accordance with ASTM C190.
2. Anti-corrosion coating shall be "CR246 Sto Bonding and Anti-corrosion Agent" by Sto Concrete Restoration Division or "Armatec 110" as manufactured by Sika Corporation, "Ardex BACA" by Ardex, or approved equal.
- E. Miscellaneous Materials
1. Water: Potable water, ASTM C94
  2. J hooks: 1/4" diameter threaded rod, Type 316 stainless steel
  3. Epoxy paste adhesive: ASTM C882
  4. Coarse aggregate: Clean, washed crushed stone, 3/8" maximum size, conforming to ASTM C33.
- F. Weather-resistant anti-carbonation coating
1. Sol silicate acrylic one-component paint with high protection from carbonation for opaque protective concrete coating.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine all adjoining work on which this Work is in anyway dependent for proper installation and workmanship. Report to the Commissioner any conditions that prevent the performance of this Work.
- B. The Contractor shall determine the most suitable material indicated in Part 2 of this Specification to be used for each application to achieve the most structural sound repair with appropriate finish, unless specifically indicated on the Drawings. As an example, the Contractor may decide to form an application on a vertical surface in lieu of using the overhead repair mortar. The contractor shall include in the restoration work procedure what



materials will be used where and how the restoration will be achieved for both the structural integrity of the patch and the correct finish.

### 3.2 PREPARATION AND PROTECTION

#### A. Protection

1. Protect adjacent surfaces not to be restored. Protect sills, ledges, and projections from material droppings.

#### B. Surface Preparation

1. Remove spalled and weak concrete and remove all loose and foreign material. Chip substrate by bush hammering or other mechanical means acceptable to the repair concrete/mortar manufacturer to obtain a minimum aggregate-fractured surface profile of  $1/8\pm$ " conforming to an ICRI CSP 7 or greater surface preparation. Minimum depth of restoration shall be  $1/2$ ", with the perimeter of the res having a minimum of  $1/8$ " in depth. Feather edging is not permitted.
2. If steel reinforcing is exposed, chip out behind the reinforcing steel. Chip a minimum of  $1/2$ " behind the bar and 3" past the point where the bar is exposed. Concrete behind bars shall be removed enough to allow for the entire circumference of the bar to be cleaned. Remove concrete to the point past where sound material begins.
3. Exposed steel reinforcement and steel beams shall be free of all rust, scale, oil, paint, grease, loose mill scale, and all other foreign matter that will prevent bonding with the restoration concrete. Use power chipping or power driven brushes and clean to an SSPC-SP2 or SP3 surface preparation.
4. Where additional reinforcement is not shown to be anchored in and for patches greater than  $1\frac{1}{2}$ " in depth and overhead patches, install stainless steel threaded J hooks set in epoxy paste adhesive. Anchor is to be  $3/4$ " clear minimum from finished face of restoration. Hooks are to be embedded a minimum of 3" into concrete, installed diagonally to plane of concrete surface. Holes are drilled  $1/8$ " larger than rod diameter and shall be cleaned thoroughly. Space hooks at 16" o.c.

### 3.3 ANTI-CORROSION COATING APPLICATION

- A. Mix anti-corrosion coating in accordance with manufacturer's instructions. Apply to dry reinforcing steel using a stiff bristle brush. Brush in well to ensure continuous coverage. Apply in two coats of approximately 10 mils each or as per manufacturer's latest recommendations.



- B. Protect coated steel from weather and allow to dry a minimum of 30-45 minutes between coats or restoration concrete/mortar application. However, apply restoration material within 24 hours after last coating. If 24 hour period elapses, reapply bonding agent and allow drying as above.

### 3.4 REPAIR CONCRETE/MORTAR APPLICATION

- A. Mix structural restoration concrete in accordance with manufacturer's instruction. Follow time limits set by manufacturer to prevent hardening of material prior to placement. For material requiring extension with aggregate due to depth of restoration, provide 3/8" aggregate of proportions specified by the repair mortar manufacturer.
- B. Prior to application of material, thoroughly saturate surface with water. Remove any standing water prior to patching.
- C. Apply a scrub coat of the restoration material of proportions determined by manufacturer (indicate in written restoration procedure). While still damp, apply restoration concrete/mortar.
- D. Apply material behind and around rebars first to completely fill void.
- E. Overhead/Vertical Restorations - Apply restoration concrete/mortar, non-formed/overhead application, on vertical and overhead members with a trowel or other such device, all in accordance with the manufacturer's recommendations. Apply in lifts of up to 2" or as determined by material manufacturer at a consistency that the material will not slump. Follow manufacturer's instructions for scoring, curing, priming, and approximate time between layers. Do not leave voids. Trowel exposed surface smooth and to same shape and finish as the adjacent existing surface.
- F. Horizontal Restorations - Pour or trowel restoration concrete/mortar, horizontal application, into hole until it is to the same level and at the same pitch as the surrounding slab. For deep restorations, extend mortar with clean aggregate by the amount recommended by the manufacturer. Provide finish as follows:
  - 1. Surfaces to receive bonded applied cementitious applications such as full-set terrazzo and vitreous ceramic tile: Darby and float surface and follow with a rough broom finish.
  - 2. Surfaces to receive floor coverings such as resilient flooring, thin-set terrazzo and vitreous ceramic tile, carpeting, wood floors, or surfaces which are intended as walking surfaces such as exposed or painted (cement finish), unless specified otherwise: Steel trowel surface to a smooth plane finish, free of score marks, grooves, depressions and ripples with a tolerance no greater than  $\pm 1/8$ " in ten feet.



3. Surfaces intended to receive roofing, waterproofing membranes: Darby and float surface. Leave surface free from depressions, bulges, rough spots, and other defects.
4. Ramps, Exterior Concrete Steps: Level surface with wood float and follow with a broom finish perpendicular to direction of traffic.

G. Formed Repairs

1. Apply restoration concrete, horizontal application, on vertical members where formwork can be utilized to confine the concrete and the width of patch area permits its proper installation.
2. Apply flowable restoration mortar for patches to be formed, especially for thin patches.
3. Place so as not to leave voids. Vibrate forms with pencil vibrator to removed air bubbles. Remove formwork as soon as possible and trowel exposed surface smooth and to same shape and finish as the adjacent existing surface.

3.5 CURING

- A. As soon as surface of patch has hardened, cure patch a minimum of 48 hours by applying water-based acrylic curing compounds conforming to ASTM C309 or C1315, misting, wet burlap, etc. For patches to be covered with other material, only use curing compounds acceptable to the finish material manufacturer, unless the compound is removed prior to placing the finish material in a manner acceptable to the finish manufacturer.
- B. Follow manufacturer's latest recommendations for any other recommendations. The curing provision of A above shall not be waived unless manufacturer does not permit it.

3.6 COATING APPLICATION

- A. Apply coating as per manufacturer's recommendations.

3.7 PROTECTION AND CLEANING

- A. Clean all adjacent areas of excess material and clean all floors and walls of powder and droppings. Remove misplaced materials from surfaces immediately.
- B. Protect material from freezing and from rainfall prior to final set.

3.8 FIELD QUALITY CONTROL

- A. The Commissioner will inspect surfaces and reject any that contain cracks or other defects. The restoration will be tested for soundness and structural integrity. Any defective areas shall be fixed at Contractor's expense. Notify the Commissioner in advance of the concrete



patches. The Commissioner will review the mixing, surface preparation and proper application of all materials.

- B. Engage the services of the material manufacturer's representative to inspect the surface preparation, instruct in the proper usage of the material and to inspect the work throughout the project.

END OF SECTION



**SECTION 03 30 00  
CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This Section includes all labor, materials, equipment, and services necessary to complete the work of cast-in-place concrete as shown on the Drawings and specified herein, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
1. Equipment pads
  2. 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.
  3. Erection and removal of all formwork required to properly complete the work.
  4. Finishing of all concrete work as hereinafter specified.
  5. Curing and protection of all concrete and cement work.
  6. Completing all other work and supplying all other materials as indicated on the drawings or as may be reasonably inferred and needed to make the work of this section complete.

**1.3 QUALITY ASSURANCE**

- A. **Installer Qualifications:** An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.



- D. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
  - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
  - 2. Formwork and form accessories.
  - 3. Concrete mixtures.
  - 4. Handling, placing, and constructing concrete.
- E. Laws, Codes, and Regulations: Perform all work of this Section in compliance with the New York City Building Code, latest edition and all its supplement
- F. Restoration of Damage: Restore and/or replace all broken and damaged elements resulting from work of this Section as directed by and to satisfaction of Commissioner at no additional cost to The City of New York

#### **1.4 SUBMITTALS**

- A. Refer to DDC General Conditions.
- B. Submit each item in this Article in compliance with the Conditions of the Contract and specification sections. Revise and resubmit each item as required to obtain Commissioner's approval
- C. Qualification Data: Qualification data for firm specified in "Quality Assurance" Article that demonstrates that firm has capabilities and experience complying with requirements specified.
- D. Product Literature: Manufacturer's published technical data for each product to be used in work of this Section including recommendations for application and use, test reports and certificates; verifying that product complies with specified requirements, and Material Safety Data Sheets (MSDS).
- E. Mix Designs: For each concrete mix.
- F. Additional Submittals: Comply with submittal requirements in ACI 301. Number additional submittals sequentially.

### **PART 2 - PRODUCTS**

#### **2.1 FORMWORK**

- A. Furnish formwork and form accessories to comply with requirements of ACI 301.

#### **2.2 CONCRETE MATERIALS**

- A. Portland Cement: ASTM C 150, Types I or II or Type I/II.



- B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 3/4-inch nominal size.
- C. Water: Potable, complying with ASTM C 94, and free of any substance that might adversely affect installation and durability of concrete or reinforcing.

### **2.3 ADMIXTURES**

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.

### **2.4 CURING MATERIALS**

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable and free of any substance that might adversely affect installation and durability of concrete or reinforcing.

### **2.5 CONCRETE MIXES**

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. Comply with NYC Mix Design B3200
- C. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:
  - 1. Compressive Strength (28 Days): 4000 psi.
  - 2. Slump: 3 inches.
- D. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 4 to 6 percent.
- E. Contractor is responsible for the TR-3 form for Concrete Design mix:
  - 1. Form TR-3: 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 TR-3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures



and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.

## **2.6 CONCRETE MIXING**

A. Ready-Mixed Concrete: Comply with ASTM C 94.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## **PART 3 - EXECUTION**

### **3.1 FORMWORK**

A. Construct, erect, and brace formwork to comply with requirements of ACI 301.

### **3.2 STEEL REINFORCEMENT**

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

### **3.3 CONCRETE PLACEMENT**

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Consolidate concrete with mechanical vibrating equipment.

### **3.4 FINISHING UNFORMED SURFACES**

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scream surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

### **3.5 TOLERANCES**

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

### **3.6 CONCRETE PROTECTION AND CURING**

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with requirements of ACI 306.1 for cold-weather protection, and comply with recommendations in ACI 305R for hot-weather protection during curing.



- B. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- C. Curing Methods: Cure formed and unformed concrete for at least seven days by moisture curing as follows:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

### **3.7 FIELD QUALITY CONTROL**

- A. Testing Agency: City of New York will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

### **3.8 REPAIRS**

- A. Remove and replace concrete that does not comply with requirements in this Section.

**END OF SECTION**



**Department of  
Design and  
Construction**

FMS No. S136-383S  
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**SECTION 04 22 00**  
**CONCRETE UNIT MASONRY**

**PART 1 - GENERAL**

1.1 **RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 **SUMMARY**

- A. Section Includes:
1. Concrete masonry units

1.3 **DEFINITIONS**

- A. CMU(s): Concrete masonry unit(s).

1.4 **PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 **SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
- C. Shop Drawings: For the following:
1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
- D. Samples for Verification: For each type and color of the following:
1. Masonry Units
- E. Qualification Data: For testing agency.



- F. Material Certificates: For each type and size of the following:
1. Masonry units.
    - a. Include data on material properties and material test reports substantiating compliance with requirements.
    - b. For masonry units, include data and calculations establishing average net-area compressive strength of units.
  2. Cementitious materials. Include name of manufacturer, brand name, and type.
  3. Anchors, ties, and metal accessories.
- G. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- H. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- C. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects.
1. Build sample panels for each type of exposed unit masonry construction to match proposed sizes.
  2. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
  3. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Commissioner in writing.
    - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Commissioner specifically approves such deviations in writing.



- D. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Build mockup of typical CMU installation as shown on Drawings.
  2. Build mockups for each type of exposed unit masonry construction, including face and backup wythes and accessories.
  3. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
    - a. Approval of mockups is also for other material and construction qualities specifically approved by Commissioner in writing.
    - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
  4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Concrete pavers shall be delivered to site in steel-banded, plastic-banded, or plastic-wrapped cubes on wooden pallets capable of transfer by fork lift.
- B. Pavers shall be unloaded at job site in such a manner that no damage occurs to the product.
- C. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of work with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  1. Extend cover down both sides of work, and hold cover securely in place.



- B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Provide Fluted Concrete Masonry Units from the following manufacturer:
  - 1. Westbrook Concrete Block, 439 Spencer Plains Road, P.O. Box 700, Westbrook, CT 06498; Tel: (860) 399-6201, Fax: (860) 399-5502
  - 2. A. Jandris & Sons, 202 High Street, Gardner, MA 01440; Tel: (978) 632-0089, Fax: (978) 632-6065
  - 3. Bauer Company, Inc., 119 Ruth Hill Road, Worthington, PA 16262; Tel: (724) 297-3200; Fax: (724) 297-3932
  - 4. Or approved equal

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
  - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.

### **2.3 UNIT MASONRY, GENERAL**

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.



- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable NYC Department of Buildings.

#### 2.4 CONCRETE MASONRY UNITS

- A. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
  - 2. Density Classification: Normal weight.
  - 3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
  - 4. Exposed Faces: Provide color and texture matching the range represented by Commissioner's sample.

#### 2.5 FLUTED CONCRETE MASONRY UNITS

- A. Exposed face shall be round-fluted. Provide size, color and texture to match the existing fluted concrete masonry units.

#### 2.6 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 641/A 641M, Class 1 coating.
  - 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
  - 3. Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.
  - 4. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 316.



- C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces.

### **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 the Work.
1. Verify that substrates are free of substances that would impair mortar bond.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION, GENERAL**

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

#### **3.3 TOLERANCES**

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus or minus 1/4" inch.
  2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/4 inch.
- B. Lines and Levels:
1. For lines and surfaces, do not vary from straight by more than 1/16 inch in 4 feet maximum.
  2. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.
- C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 3/8 inch.



2. For head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

### 3.4 LAYING MASONRY WALLS

- A. Lay out CMU in advance for accurate spacing of surface bond patterns with uniform joint thicknesses. Avoid using less-than-half-size units where possible.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  2. Bed webs in mortar in all courses.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush.

### 3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
  1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  2. Anchor masonry with anchors embedded in masonry joints and attached to structure.



3.7 LAYING MASONRY PAVERS

- A. Concrete pavers to be loose laid as ballast material at flashing pan.

3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: The City of New York will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Testing Prior to Construction: One set of tests.
- C. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

3.9 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. 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 nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of 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 or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.



5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

END OF SECTION



**Department of  
Design and  
Construction**

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*District SI-3 Garage and Repair Shop  
HVAC System and Roof Replacement*

Concrete Unit Masonry  
04 22 00- 10



**SECTION 05 10 00  
STRUCTURAL STEEL**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENT:**

- A. The following documents apply to all required work for the Project:
1. the Contract Drawings
  2. the Specifications
  3. the General Conditions
  4. the Addendum
  5. the Contract [City of New York Standard Construction Contract.

**1.2. GENERAL DESCRIPTION**

- A. Work of this Section shall conform to the requirements of the DDC General Conditions.

**1.3. DESCRIPTION**

- A. Work included: Structural steel required for this work is indicated on the drawings and includes, but is not limited to the following:
1. Installation of beams and posts
  2. Shop or field painting and field touch-up.
  3. Surveying of erected steel.
  4. All connections.
  5. All other work which may reasonably be inferred as making the work of this Section complete.

**1.4. QUALITY ASSURANCE**

- A. Standards and Codes:
1. Except as modified by the requirements specified herein, the following codes and standards (latest editions and revisions unless noted) shall apply to the work of this Section:
    - a. New York City Building Code.
    - b. AISC - "Specification for Structural Steel Buildings."



- c. AISC - "Code of Standard Practice", Latest Edition. As modified within this specification.
- d. AISC - "Specifications for Structural Joints Using ASTM A325 or A490 Bolts," including commentary section.
- e. American Society for Testing and Materials - ASTM Standards.
- f. AWS - "Structural Welding Code," D1.1 - including all supplements, addenda, and special rulings applicable to building construction, except amendments to sections or inspection specified herein.
- g. SSPC - "Steel Structures Painting Manual"
- h. Welding Rules 13 thru 17 New York City Board of Standards and Appeals, Cal. No. 1-38 Sr, Volume II.
- i. Occupational Safety and Health Act of 1970 (OSHA), as amended to date.

**B. Testing and Inspection:**

1. Manufacturer's certification or letter of compliance of bolt, nut, washer and filler material for welding shall be furnished, to the Commissioner.
2. Testing and inspection of structural steel will be performed by an independent testing agency retained and paid for by the City of New York. The inspection service shall be provided with the following:
  - a. A complete set of approved shop and erection drawings.
  - b. Full and ample means of assistance for testing inspection of material.
  - c. Proper facilities, including scaffolding, temporary work platforms, etc., for inspection of the work in shop and field.
3. Each bolting crew and welder shall be assigned an identifying symbol or mark and all shop and field connections shall be so identified that the inspector can refer back to the crew or person making the connection.
  - a. Testing and Calibration: Apparatus and procedure for measuring torque and tension for calibrating wrenches shall be furnished and maintained by the Contractor, and shall be approved by the City of New York's Inspection Agency. Impact wrenches shall be calibrated each day at beginning of work, each time the bolt size or length of pressure hose is changed, and at such other times as the inspection service may direct.



4. Field inspection will consist of, but not limited to the following:
  - a. Certification of welders.
  - b. Inspection and testing of bolting and welding in accordance with Contract Documents, Specifications and The New York City Building Code
5. All welding inspection for shop and field will, in general consist of complete visual inspection, and the following:
  - a. Magnetic Particle Inspection - as per ASTM E709.
    - (1) Manual Fillet Welds - Random testing approximately 10% linear inches of weld made.
  - b. Ultrasonic Inspection - As per AWS Section 6, Part C and Section 8.15.3.
    - (1) Manual Groove Welds - Ultrasonic testing, all welds - 100% tension.
    - (2) Tension Welds - Ultrasonic inspection of all welds
    - (3) Compression welds automatic 25% of all welds - manual - all welds.
    - (4) Procedures for testing prior to welding in regard to base material, shall be in accordance with ASTM A-435. Restore (or replace) rejected material at no cost to the City of New York. Restore (or replace) restored material if rejected after welding, at no cost to the City of New York.
    - (5) Liquid penetration as per ASTM E-165, if required.
6. Inspection by inspector assigned by the testing agency retained by the City of New York under section 1.4.B.2., does not relieve the Contractor of his responsibility to perform the work and provide the materials required.
7. If material or workmanship is rejected by inspector assigned by the City of New York, the following procedures shall be adhered to:
  - a. Any and all material or workmanship which is rejected at the shop or building shall be promptly replaced without additional cost to the City of New York.
  - b. If arrangements for replacements are not made after seven days since notice of rejection, the Commissioner will have the option to replace rejected material at no cost to the City of New York.



- c. Rejected steel shall be removed from the site within three working days of notice of rejection without additional cost to the City of New York.

C. Reports:

1. Reports on shop and field welding and bolting and structural steel shall include the following:
  - a. Name of inspectors.
  - b. Description of work.
  - c. Description of type of inspection.
  - d. Type of weld (or bolts).
  - e. Condition of weather.
  - f. Welding operator's name and number.
  - g. Type of welding equipment (or bolt size).
  - h. Total inches of welds made (or bolted locations), inspection, rejection, acceptance.
  - i. Remarks.
2. Immediately after tests or inspections have been made, the laboratory shall furnish copies of all tests and inspection reports to:
  - a. Commissioner
3. Permanent records of the details of all tests shall be maintained by the laboratory.
4. Laboratory data records and field books shall be available for examination by parties upon request.



**1.5. SUBMITTALS**

- A. Refer to DDC General Conditions
- B. The Contractor shall retain a professional engineer licensed in the State of New York to prepare detailing data regarding all connections.
- C. From the design drawings, the Contractor shall submit to the Commissioner for approval prior to fabrication full dimensioned drawings of all items in this Section.
- D. Drawings shall include all fabrication, erection plans, member details
  - 1. Substitutions of shapes or sections, or modifications of details, or both and all deviations from the Structural Design Drawings, and the reasons therefore, shall be submitted with shop drawings for approval and shall be specifically called to the attention of the Commissioner.
  - 2. The Contractor alone shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.
  - 3. All individual piece drawings shall clearly reference the appropriate job standard and shall clearly show the provided connection reaction or force.
- E. The Contractor shall be responsible for the correct coordination of his work where it comes in conjunction and/or contact with any other work. Dimensions are the responsibility of the Contractor.
- F. Fabrication of any material or performance of any work shall not proceed until shop drawings have been approved by the Commissioner.
- G. Final Drawings: Drawings at completion of the structural steel work shall be submitted.

**1.6. DELIVERY AND STORAGE**

- A. Structural steel shall not be handled until paint has thoroughly dried. Care must be exercised to avoid abrasions and other damage.
- B. Material shall be stocked out of mud and dirt and proper drainage shall be provided. Structural steel must be protected from damage or soiling by adjacent construction operations.

**PART 2 – PRODUCTS**

**2.1 MATERIALS**

- A. All materials shall conform to the requirements of the current editions of the ASTM and other specifications and standards listed below.



## 2.2 STRUCTURAL STEEL

- A. Steel shall comply with requirements of the following specifications:
1. Steel shall be ASTM A36, A992 Grade 50, or other, as noted on the drawings.
  2. A certificate of conformance shall be submitted to the Commissioner by the steel manufacturer certifying that the steel is new steel conforming to the above referenced ASTM specification.

## 2.3 BOLTS

- A. Bolts shall comply with requirements of the following specifications:
1. High Strength Bolts (carbon steel) - ASTM A325.
  2. All ASTM A325 bolts shall be preferably cold-forged and with rolled threads. Note: Type 2 A325 bolts are not to be used.
  3. All heavy hex nuts for high strength bolts must be ASTM A194 2H or ASTM A563 DH for use with plain (uncoated) bolts or nuts under ASTM A194 or A536 that have a minimum proof stress not below 175,000 psi. No other nuts are acceptable, and nuts must show both the manufacturer's mark and the relevant symbol.

## 2.4 WASHERS

- A. Round washers shall conform to the American Standard B27, Type B. Washers in contact with high strength bolt heads and nuts shall be hardened in accordance with ASTM Designation A325. Beveled washers shall be furnished in accordance with the specifications of the "Research Council on Riveted and Bolted Structural Joints."
- B. Hardened round washers in contact with high strength bolt heads and nuts must be manufactured to ASTM F436 which requires a hardness of 38 to 45 HRC and must show manufacturer's mark. Washers for use with short slotted or oversized holes on over 1" A490 bolts must also be 5/16" thick or thicker.

## 2.5 ELECTRODES AND FLUX

- A. Electrodes and flux for carbon steel shall be low hydrogen (E70) and shall conform to the requirements of the current edition of the American Welding Society's Standard Code for Welding in Building Construction (D1.1) and current rules and regulations of the New York City Building Code.



## 2.6 PAINT

### A. Paint for coating of steel for exposed exterior structural steel:

1. Tnemec Series 27 FC,
2. Steel-Tech High Performance Epoxy Coating
3. Sherwin Williams Recoatable Epoxy Primer
4. Or Approved equal.

## 2.7 FABRICATION

### A. Size of Holes:

1. Ordinary holes shall be nominal bolt diameter plus 1/16".
2. Members with shear connections only may have elongated holes of nominal bolt diameter plus 3/16" in direction perpendicular to load.
3. Holes, slots and openings required by other trades and contracts shall be provided, together with necessary reinforcing as shown on the drawings. Suitable templates for proper location shall be used.
4. Manual oxygen cutting shall be done only with a mechanically guided torch. Any unguided torch may be used provided cut is not within 1/2" of the finished dimension and final removal is completed by means such as chipping or grinding to produce a surface quality equal to that of the base metal.
5. Exposed exterior structural steel shall have exposed sharp edges and corners ground off smooth and rounded or chamfered. Where water will collect in members, drain holes at low points with chamfered edges shall be provided.

## 2.8 CONNECTIONS

- A. Connections shall be a minimum of 3/4" dia. with a minimum of 2 bolts. Minimum connections shall conform to appropriate tables headed "Uniform Load Constants" shown in the manual of steel construction of AISC. Composite beam reactions will be greater. Criteria for determining minimum connection capacity required is shown on the structural drawing.
- B. Shop connections not indicated on the structural drawings shall be prepared by fabricator and submitted to the Commissioner for review. Where connections are indicated on the structural drawings, no deviation from the approved type and method thereof shall be made without the approval of the Commissioner. Single angle, one-sided, or other type of eccentric connections will not be permitted unless specifically approved by the Commissioner.



- C. Bolted connections: Bolts shall be driven accurately into the holes without damaging the thread, and bolt heads and nuts shall rest squarely against metal. Bolt heads shall be protected from damage during driving.
1. All bolts shall be drawn up to a bolt tension not less than that specified in Table 3 of the AISC Specification for Structural Joints using ASTM A325 or A490 bolts, and the Specifications for Structural Joints Research Council on Riveted and Bolted Structural Joints. An approved, calibrated, manual or power torque shall be used to obtain the proper torque and tension.
  2. Bolts shall be of a length that will extend not less than 1/4" beyond the nuts.
  3. All bolts shall be high strength slip critical bolts.
  4. In addition to all other requirements, a hardened washer shall be installed between all bolt heads or nuts and material having elongated holes.
- D. Welded Connections:
1. Before welding, particular attention shall be paid to surface preparation, fit up and cleanliness of surface to be welded.
  2. Minimum preheat and interpass temperatures for structural steel welding shall be as specified in the American Welding Society Standard for Welding in Building Construction, except that no welding shall be performed when ambient temperature is lower than 0 degrees F. The temperature shall be measured from the side opposite that upon which preheat is applied.
  3. Welding shall be done by the American Welding Society's approved methods.
  4. The head, input, length 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.
  5. No welding shall begin until joint elements are bolted in intimate contact and adjusted to dimensions shown on the drawings, or both, with allowance for any weld shrinkage that is expected. Heavy sections and those having a high degree of restraint with low hydrogen type electrodes shall be welded. No members are to be spliced without prior approval of the Commissioner.
  6. Welds shall be sounded throughout. There shall be no defect in any weld or welds pass.
  7. Welds shall be free from overlap.
  8. Craters shall be filled to the full cross section of the weld.
  9. Exposed exterior structural steel shall have joints seal welded.
- E. The contact surface of high strength bolted and welded connections shall be cleaned and left unpainted. The several pieces forming any built-up or joint shall be straight



and close fitting, free from twists, bends or open joints in the finished assembly.

## **2.9 SHOP PAINTING AND COATING**

### **A. Preparation:**

1. Structural steel exposed to the exterior shall be cleaned in accordance with SSPC-SP6 Commercial Blast Cleaning.
2. All steel shall be cleaned in accordance with SSPC-SP2 Hand Tool Cleaning.

### **B. After fabrication, all steel shall receive a shop coat of paint, except for the following:**

1. Areas within 2" of field welds.
2. Contact surfaces of high strength bolted friction type connections.

### **C. Application:**

1. Paint shall be applied to dry surfaces, when temperatures are above dew point, thoroughly and evenly, strict accordance with manufacturer's label instructions, to provide a dry film thickness of 4.0 - 6.0 mils for exterior steel. Paint shall be dry before handling or loading steel for shipment.
2. Surfaces inaccessible after assembly or erection shall receive a second coat of the shop paint.

### **D. Machined surfaces shall be protected by an approved rust-inhibitive coating, readily removable prior to erection, or of a type not requiring removal.**

### **E. Complete painting details shall be included in the shop drawings.**

### **F. Field Touch-Up:**

1. After erection, all damaged areas in the shop coat, loosened scale, rust, exposed surfaces of bolts, nuts and washers, and all field welds and unpainted areas shall be cleaned to the same standards as the shop coat and painted with the same paint used for the shop coat, at same film thickness.

## **PART III- EXECUTION**

### **3.1 LAYOUT**

- A. Installation of Work under This Contract:** The Contractor shall be responsible for the accurate placement of his work in accordance with the location and elevations shown on the drawing.
- B. Dimensions and Levels:** Before starting the work, the Contractor shall verify all dimensions and levels.



### **3.2 ERECTION**

- A. Anchor bolts and other required anchorage items shall be verified for proper size and accurate location prior to erection of steel work.
- B. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and structural fitting of parts shall be reported immediately to the Commissioner, and approval of the method of correction shall be obtained. Approved corrections shall be made at no additional cost to the City of New York.
- C. Field connections shall be made as herein before specified.
- D. As erection of the steel progresses, the work shall be fastened securely to take care of all dead load, wind and erection stresses. Poor matching of holes shall be corrected by drilling to the next larger size, and the use of larger size bolts. Welding or re-drilling will not be permitted without approval of the Commissioner. Hammering which will injure or distort the members will not be permitted.
- E. Cutting of Steel: The use of flame, cutting torches, in the field for correction of fabrication errors will not be permitted on any member in the structural framing.

### **3.3 PLUMBING AND LEVELS**

- A. All members shall be aligned, leveled and adjusted accurately prior to final fastening. Tolerances shall conform to the AISC Code of Standard Practice except as modified below.

### **3.4 FIELD PAINTING**

- A. Preparation:
  - 1. All steel shall be cleaned in accordance with SSPC-SP2 Hand Tool Cleaning.
- B. After erection of structural steel exposed on exterior of building, all abrasions, bolt heads and surfaces left uncoated for welding and bolting shall be touched up with special epoxy-zinc coating or painted with the same paint (at same film thickness) of a different color.

**END OF SECTION**



**SECTION 05 30 00  
METAL DECKING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENT:**

- A. The following documents apply to all required work for the Project:
1. the Contract Drawings
  2. the Specifications
  3. the General Conditions
  4. the Addendum
  5. the Contract [City of New York Standard Construction Contract.

**1.2 SCOPE OF WORK**

- A. All materials, labor, equipment and services necessary to furnish, deliver, and install all work for this section shall be provided as shown on the drawings, as specified, and as required by job conditions, including but not limited to the following:
1. Welding: Including all welding required to properly fabricate and erect the steel decking.
  2. Cutting of Openings: Steel decking shall be cut by the Contractor as required to fit pre-determined holes and structural steel framed openings which are located and dimensioned on the structural, architectural, mechanical and electrical drawings.
    - a. Other than predetermined holes, all holes required by other trades shall be provided by the trades requiring the holes (other than predetermined holes). Cutting shall be performed as hereinafter specified.
    - b. Shop and field cutting of steel decking (permanent formwork) as required to provide sufficient clearance for brackets and the work of other trades and all coping and welding of such members shall be included under the Contract.
  4. Reinforcing for Openings and Holes: The reinforcing required for all openings and holes passing through the steel decking shall be furnished and installed under this Contract regardless of by whom the holes have been cut.
  5. Hoisting of all materials required to be furnished and installed under this Contract.
  6. Painting: All touchup painting required for weld areas and damaged surfaces of steel decking and accessory items shall be performed under this Contract.
  7. Safety Requirements: The Contractor shall be held responsible for compliance with the safety requirements of all including the Occupational Safety and Health Administration.



### 1.3 RELATED WORK DESCRIBED IN OTHER SECTIONS

- A. Structural Steel - Section 05 10 00.
- B. Field painting of steel decking, except for touch-up specified under "Scope"

### 1.4 QUALITY ASSURANCE

- A. Structural adequacy of deck sections shall be established in accordance with the methods set forth in the latest edition of the AISI Specifications for the Design of Cold Formed Steel Structural Members. The "moment" and deflection coefficient used shall be in accordance with the Steel Deck Institute's recommendations. Metal decking shall sustain all dead loads plus live loads.
- B. Certification of Welders: All welding shall be performed by competent experienced welding mechanics. Furnish certification stating that all welders employed on the work have passed qualification tests using procedures specified in the American Welding Society's Standard B3.0, Part II, current edition, and that such welders have been performing satisfactory welding of the required type within the three month period immediately preceding this job.
  - 1. A certification shall be submitted for each welding mechanic stating date of examination, results of testing, name of welder, and name and title of person conducting the examination.
  - 2. All welders shall be licensed by the State of New York.
- C. Standards: All welding shall be performed in accordance with the applicable sections of the American Welding Society's Standard D1.0 for Welding In Building Construction.
- D. U.L. Approval: All welding shall be performed in strict accordance with the Underwriter's Laboratories' approvals in all cases, with no interchangeability or equivalent materials authorized.

### 1.5 SUBMITTALS

- A. Refer to DDC General Conditions
- B. Drawings: Based on design drawings, the Contractor shall prepare fabrication and erection drawings of all steel deck work. In addition, shop drawings shall be prepared and submitted to the Commissioner for review.
- C. Design Computation: In accordance with the Commissioner's design, the Contractor shall detail and be responsible for the component parts of the steel deck, indicating location, type, size, and materials, welds (length and dimensions), reinforcing, closures and the like.
- D. Shop drawings shall be submitted, sufficiently in advance of the start of the work to allow time for examination and review. No fabrication shall be started prior to review of the drawings.
  - 1. Modification of details and all deviations from the design drawings, and the reasons therefore, shall be submitted for review with the shop drawings. Each modification or deviation shall be brought to the Commissioner's attention.
  - 2. Responsibility for all errors in detailing, fabrication and fitting of the steel decking shall be the Contractor's. Care shall be taken to maintain all architectural clearances.



3. Index sheets shall be submitted with all deck details at time of submission. Where field welding is required, details shall be submitted at same time as corresponding shop drawings.
- E. Mill Reports: The Contractor shall submit mill reports (certified) covering the physical properties and other pertinent information of all steel decking required under this Contract.

## **1.6 DELIVERY AND STORAGE**

- A. All material shall be delivered to the construction site free from warpage, rust, dirt and shall be stored under protective covers on dunnage.

## **PART 2 - PRODUCTS**

### **2.1 STEEL DECKING**

- A. Steel roof deck shall be 22 gauge, 1 1/2" deep wide rib unless otherwise noted on plans shall be galvanized and formed from steel conforming to ASTM A-653 (current edition) Grade C.
- B. Shop Welding of Steel Decking: When two (2) or more units are assembled by welding to form one unit, and the properties of that unit have been calculated in accordance with the AISC Specifications, the welds integrating the sheets into the unit shall be sufficient to develop the full horizontal shear at the plane where the sheets are jointed. The design strength per weld shall be in accordance with the aforementioned specifications.
- C. Spot welds shall be made using resistance spot-welders with electronic timers and heat controls, with uniformly applied pressure, and incorporating slope and temper controls to properly anneal the welds.

### **2.2 CLOSURES AND FLASHING**

- A. The Contractor shall furnish and weld in place all sheet metal closures and fillers as required to close between roof units and columns, beams and girders, ends of runs, and in all other locations where shown and noted on the Structural and Architectural Drawings. Include metal flashing wherever shown. In addition include closures, fillers and flashing in all locations as required for proper installation whether or not indicated on the Drawings.
- B. Gauges: Except as otherwise indicated on the structural drawings, closures and fillers shall be not less than No. 18 gauge in thickness; flashings not less than No. 12 gauge.
- C. Deck support steel required to be furnished and installed under this Contract shall conform to the requirements of ASTM A36, current edition. Sizes of steel angles shall be in accordance with the details at columns appearing on the Structural Drawings



## **PART 3 - EXECUTION**

### **3.1 SEQUENCE OF ERECTION**

- A. **Coordination with Other Trades:** The Contractor will coordinate certain portions of the steel decking installation so that other trades may complete their work in proper sequence.
- B. **Manufacturer's Standard:** All steel decking shall be erected in accordance with the manufacturer's standard methods. Steel deck shall be placed on the supporting steel frame work and adjusted to final position before being permanently fastened. Each unit shall be brought to proper bearing on the supporting beams. If the supporting beams are not in proper alignment, or at proper level, this Contractor shall bring the matter (in writing) to the attention of the Commissioner for corrective action, and shall see that the correction is made before finally placing steel deck units.
- C. **Erection:** Panels shall be placed with edges up and flutes at right angles to structural steel supports. End laps shall always occur over supporting members. Minimum end lap shall be 2". Panels shall be lapped not less than 1/2" flute at side laps and welded at 3'- 0" on center. Panels shall be attached to top flange of steel beam supports by plug welding.
- D. **Welding:** Unless otherwise noted on the structural drawings, end laps shall be fastened using a weld washer at each side lap plus one intermediate weld (three welds per sheet). At intermediate supports weld sheets at side laps at each such support.
- E. **Alignment and Span:** The floor unit shall be placed in straight alignment for the entire length of the run of the peaks and valleys.
- F. **Installation of steel decking shall closely follow the erection of the structural steel framing.**
- G. **Closures shall be fastened in place by tack welding not more than four feet on center for end closures and not more than three feet on center for side closures.**
- H. **After panels have been placed and aligned, they shall be immediately welded to the supporting steel.**

### **3.2 HOLES**

- A. **Holes:** Steel decking shall be cut by the respective trades as required to pass their work from floor to floor.
- B. **Definition of Holes:** Holes shall be defined as any aperture cut through the steel flooring in unframed areas to accommodate sleeves for pipes, ducts, conduits and the like.
- C. **Reinforcing:** All holes cut through steel decking shall be reinforced under this Contract as previously specified under the "Scope", except that holes 6" or less in diameter, and holes in which the distance cut across a flute is 6" or less, need not be reinforced, provided adjacent holes are not closer than 2'-6" on center. Required reinforcing shall be U.S.S. No. 14 gauge sheet steel and 4", 5.4 lbs. steel channels respectively as shown and noted on the Structural Drawings. All welds shall be a minimum of 3/4" in length and spaced not more than 8" on center.
- D. **In all locations where support of the units has not been provided by the steel framing, it shall be this Contractor's responsibility to furnish and install sufficient reinforcement and support the decking. Such support and reinforcing shall meet the Commissioner's approval.**



**3.3 FIELD QUALITY CONTROL**

- A. Inspection of steel roof decking shall include the following:
  - 1. Verification that all steel decking is erected in accordance with approved drawings, Contract Documents and Steel Deck Institute
  - 2. All field welding of metal deck to steel supporting members shall be inspected by visual means to ascertain that all welds conform with drawings and with the Steel Deck Institute requirements.
- B. Testing and inspection of welding will be supervised and paid for by The City of New York.

**END OF SECTION 05 30 00**



**Department of  
Design and  
Construction**

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**SECTION 06 10 00  
ROUGH CARPENTRY**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section Includes:
1. Rooftop equipment bases and support curbs.
  2. Wood blocking, cants, and nailers.
  3. Wood sleepers.
  4. Utility shelving.
  5. Plywood backing panels.

**1.3 DEFINITIONS**

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Timber: Lumber of 5 inches nominal size or greater in least dimension.

**1.4 ACTION SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.



3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Sustainable Design Submittals:

1. Restrictions on the use of urea-formaldehyde containing materials.

D. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
  1. Wood-preservative-treated wood.
  2. Fire-retardant-treated wood.
  3. Power-driven fasteners.
  4. Post-installed anchors.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to NYC Department of Buildings that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
- C. Each piece of lumber and plywood shall be grade stamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface or ends of pieces with finished surfaces.
  1. Pressure Preservative Treated Material: Accredited agency quality mark on each piece of wood including treatment.
  2. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.



1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness.
- C. Engineered Wood Products: show compliance with NYC Building Code.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
  - 1. Preservative Chemicals: containing no arsenic or chromium.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.



1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat all rough carpentry unless otherwise indicated.

### 2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by testing agency.

E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all rough carpentry unless otherwise indicated.

### 2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:



1. Blocking.
  2. Nailers.
  3. Rooftop equipment bases and support curbs.
  4. Cants.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
1. Hem-fir (north); NLGA.
  2. Mixed southern pine or southern pine; SPIB.
  3. Spruce-pine-fir; NLGA.
  4. Hem-fir; WCLIB or WWPA.
  5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
  6. Western woods; WCLIB or WWPA.
  7. Northern species; NLGA.
  8. Eastern softwoods; NeLMA.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

## 2.6 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to NYC Building Code, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to NYC Building Code, based on ICC-ES AC01 as appropriate for the substrate.



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.

## 2.7 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels..
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.



1. Use inorganic boron for items that are continuously protected from liquid water.
  2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  3. ICC-ES evaluation report for fastener.
- L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION



**Department of  
Design and  
Construction**

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**SECTION 07 01 50.19**  
**PREPARATION FOR REROOFING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section Includes:
1. Full tear-off of entire roof system.
  2. Removal of flashings and counterflashings.

**1.3 DEFINITIONS**

- A. EPS: Molded (expanded) polystyrene.
- B. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.
- C. OSB: Oriented strand board.
- D. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

**1.4 PREINSTALLATION MEETINGS**

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at District SI-3 Garage, 1000 West Service Road, Staten Island, NY 10314.
1. Meet with The City of New York, The Commissioner, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
    - a. Reroofing preparation, including roofing system manufacturer's written instructions.



- b. Temporary protection requirements for existing roofing system components that are to remain.
- c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
- d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
- e. Existing roof deck conditions requiring The Commissioner notification.
- f. Existing roof deck removal procedures and The City of New York notifications.
- g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
- h. Structural loading limitations of roof deck during reroofing.
- i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
- j. HVAC shutdown and sealing of air intakes.
- k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
- l. Asbestos removal and discovery of asbestos-containing materials.
- m. Existing conditions that may require the Commissioner notification before proceeding.

#### 1.5 ACTION SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Field Test Reports:
  - 1. Fastener pull-out test report.
- B. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
  - 1. Submit before Work begins.
- C. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

#### 1.7 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

- B. Installer Qualifications: licensed to perform asbestos abatement in New York City.
- C. Regulatory Requirements:
  - 1. Comply with governing EPA notification regulations before beginning roofing removal.
  - 2. Comply with hauling and disposal regulations of NYC Department of Buildings.

1.8 FIELD CONDITIONS

- A. Existing Roofing System: Built-up asphalt roofing.
- B. The City of New York will not occupy portions of building immediately below reroofing area.
  - 1. Conduct reroofing so The City of New York's operations are not disrupted.
  - 2. Provide the Commissioner with not less than 72 hours' written notice of activities that may affect The City of New York's operations.
  - 3. Coordinate work activities daily with The Commissioner so it has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
  - 4. Before working over structurally impaired areas of deck, notify the Commissioner to evacuate occupants from below affected area.
    - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by the City of New York as far as practical.
  - 1. The results of an analysis of test cores from existing roofing system are available for Contractor's reference.
  - 2. Construction Drawings for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.
- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to 300 lbs for point loads and 20 psf for uniformly distributed loads.
- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.



1. Remove only as much roofing in one day as can be made watertight in the same day.

H. Hazardous Materials

1. Hazardous materials will be removed by The City of New York before start of the Work.
2. Existing roof will be left no less watertight than before removal.
3. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the Commissioner.

- a. Hazardous materials will be removed by The City of New York under a separate contract.

I. Hazardous Materials: A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
3. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

1.9 WARRANTY

- A. Existing Warranties: Not Applicable.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. EPS Insulation: ASTM C 578.
- B. Plywood: DOC PS 1, Grade CD, Exposure 1.
- C. OSB: DOC PS 2, Exposure 1.

2.2 REPLACEMENT MATERIALS

- A. Steel deck is specified in Section 05 30 00 "Metal Decking."
- B. Wood blocking, curbs, and nailers are specified in Section 06 10 00 "Rough Carpentry."
- C. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.



### 2.3 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protection of In-Place Conditions:
  - 1. Limit traffic and material storage to areas of existing roofing that have been protected.
  - 2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
- B. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
  - 1. Immediately notify The Commissioner of any blockages or restrictions.
- E. Coordinate with The City of New York to shut down air-intake equipment in the vicinity of the Work.
  - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
  - 1. Prevent debris from entering or blocking roof drains and conductors.
    - a. Use roof-drain plugs specifically designed for this purpose.
    - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
  - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.



- a. Do not permit water to enter into or under existing roofing system components that are to remain.

### 3.2 ROOF TEAR-OFF

- A. Notify the Commissioner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Remove aggregate ballast from roofing.
- D. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.
- E. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing roof deck
  1. Remove vapor retarder, roof insulation and cover board.
  2. Remove base flashings and counter flashings.
  3. Remove perimeter edge flashing and gravel stops.
  4. Remove copings.
  5. Remove expansion-joint covers.
  6. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
  7. Remove roof drains indicated on Drawings to be removed.
  8. Remove wood blocking, curbs, and nailers.
  9. Remove excess asphalt from steel deck.
    - a. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.
  10. Remove fasteners from deck.

### 3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify the Commissioner.
  1. Do not proceed with installation until directed by the Commissioner.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify the Commissioner.



1. Do not proceed with installation until directed by the Commissioner.
- D. Provide additional deck securement as indicated on Drawings.
- E. Replace steel deck as indicated on Drawings.
- F. Replace steel deck as directed by the Commissioner.
- G. Prepare and paint steel deck surface.
  1. Painting and preparation for painting is specified in Section 09 91 13 "Exterior Painting."

### 3.4 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
  1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that are to remain.
  1. Replace metal counterflashings damaged during removal with specified in Section 076200 "Sheet Metal Flashing and Trim."
- C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
  1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify the Commissioner.
- D. When directed by the Commissioner, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 061000 "Rough Carpentry".

### 3.5 FASTENER PULL-OUT TESTING

- A. Retain independent testing and inspecting agency to conduct fastener pull-out tests according to SPRI FX-1, and submit test report to The Commissioner and roofing manufacturer before installing new roofing system.
  1. Obtain roofing manufacturer's approval to proceed with specified fastening pattern.
    - a. Roofing manufacturer may furnish revised fastening pattern commensurate with pull-out test results.

### 3.6 DISPOSAL

- A. Collect demolished materials and place in containers.



1. Promptly dispose of demolished materials.
  2. Do not allow demolished materials to accumulate on-site.
  3. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off The City of New York's property.

END OF SECTION



**SECTION 07 21 00**

**INSULATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This Section includes the following:
1. Batt Insulation at fire-rated partitions

**1.3 PERFORMANCE REQUIREMENTS**

- A. Plenum Rating: Provide glass-fiber insulation where indicated in ceiling plenums whose test performance is rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to NYC Department of Buildings.
1. Erosion Test Results: Insulation shows no visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500-fpm air velocity.
  2. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosium on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product indicated.
- C. Samples for Verification: Full-size units for each type of exposed insulation indicated.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.
- E. Research/Evaluation Reports: For foam-plastic insulation.



1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to NYC Department of Buildings. Identify materials with appropriate markings of applicable testing and inspecting agency.
  - 1. Surface-Burning Characteristics: ASTM E 84.
  - 2. Fire-Resistance Ratings: ASTM E 119.
  - 3. Combustion Characteristics: ASTM E 136.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
  - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

**PART 2 - PRODUCTS**

2.1 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers:
  - 1. CertainTeed Corporation.
  - 2. Johns Manville.
  - 3. Owens Corning.



4. Or Approved Equal.
- B. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft, foil-scrim, or foil-scrim-polyethylene vapor-retarder membrane on 1 face.
- C. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:
  1. 3-1/2 inches thick with a thermal resistance of 13 deg F x h x sq. ft./Btu at 75 deg F.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
  1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Clean substrates of substances harmful to insulation, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

#### **3.3 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.



3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions and section C402.2.1 of the 2016 NYC Energy Conservation Code. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

3.5 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.
- C. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.6 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION



**SECTION 07 52 16**

**MODIFIED BITUMINOUS MEMBRANE ROOFING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
2. Substrate board.
3. Vapor retarder.
4. Roof insulation.
5. Cover board.

- B. Section includes the installation of sound-absorbing insulation strips in ribs of roof deck. Sound-absorbing insulation strips are furnished under Section 053000 "Metal Decking."

C. Related Requirements:

1. Section 061000 "Rough Carpentry"
2. Section 072100 "Thermal Insulation"
3. Section 076200 "Sheet Metal Flashing and Trim"
4. Section 077100 "Roof Specialties"
5. Section 079200 "Joint Sealants"

**1.3 DEFINITIONS**

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

**1.4 PREINSTALLATION MEETINGS**

- A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at District SI-3 Garage, 1000 West Service Road, Staten Island, New York 10314.

1. Meet with The City of New York, The Commissioner, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck



- Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  7. Review temporary protection requirements for roofing system during and after installation.
  8. Review roof observation and repair procedures after roofing installation.
- B. Preinstallation Roofing Conference: Conduct conference at District SI-3 Garage, 1000 West Service Road, Staten Island, New York 10314.
1. Meet with The City of New York, The Commissioner, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  7. Review temporary protection requirements for roofing system during and after installation.
  8. Review roof observation and repair procedures after roofing installation.

#### 1.5 ACTION SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
  1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.
- C. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:
  1. Layout and thickness of insulation.
  2. Base flashings and membrane terminations.



3. Flashing details at penetrations.
4. Tapered insulation, including slopes.
5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
6. Crickets, saddles, and tapered edge strips, including slopes.
7. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
8. Tie-in with adjoining air barrier.

D. Samples for Verification: For the following products:

1. Cap Sheet: Bright White
2. Flashing Sheet

E. Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  - a. Submit evidence of complying with performance requirements.
2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

C. Product Test Reports: For roof membrane and insulation, tests performed by a qualified testing agency, indicating compliance with specified requirements.

D. Evaluation Reports: For components of membrane roofing system, from ICC-ES.

E. Field Test Reports:

1. Concrete internal relative humidity test reports.
2. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.

F. Field quality-control reports.

G. Sample Warranties: For manufacturer's special warranties.



1.7 CLOSEOUT SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Maintenance Data: For roofing system to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualifications: A qualified manufacturer that is UL-listed for roofing system identical to that used for this Project.
- C. Installer Qualifications: The contractor or subcontractor performing the work for this section must be a company regularly engaged in performing roofing projects with its own workforce and have successfully completed in a timely fashion at least three (3) roofing projects similar in scope, size and type to the required work within the last three (3) consecutive years prior to the bid opening. At least one of those projects must have been performed within the last twelve (12) months. The three (3) qualifying projects must have utilized one or more of the roofing systems specified for the project being bid herein, been installed by the contractor's or subcontractor's company utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by the manufacturer of the roofing system. In addition, the contractor or subcontractor must be a certified or authorized installer for at least one of the manufacturer's roofing systems specified herein and shall submit proof of same.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
  - 1. Protect stored liquid material from direct sunlight.
  - 2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
  - 1. Store in a dry location.
  - 2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.



1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards, vapor retarder, substrate board and other components of roofing system.
  2. Warranty Period: 20 years of Roof Membrane/System Guarantee from date of Substantial Completion.

**PART 2 - PRODUCTS**

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
1. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
  2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746/D 3746M, ASTM D 4272/D 4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897.
- D. ENERGY STAR Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low slope roof products.
- E. Energy Performance: Roofing system shall have initial Solar Reflectance not less than 0.70 in accordance with ASTM C1549 and Thermal Emittance not less than 0.75 in accordance with ASTM C1371.
- F. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency.

Modified Bituminous Membrane Roofing

07 52 16 - 5



1. Identify products with appropriate markings of applicable testing agency.
- G. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.
  1. Identify products with appropriate markings of applicable testing agency.

## 2.2 MANUFACTURERS

- A. Source Limitations: Obtain components for roofing system from:
  1. Siplast, 1000 Rochelle Blvd., Irving, TX 75062-3940

## 2.3 BASE SHEET MATERIALS

- A. SBS-Modified Bitumen Fiberglass Mat Base Sheet: ASTM D 6163/D 6163M, Type II, Grade S, SBS-modified asphalt sheet, reinforced with fiberglass fabric, smooth surfaced, suitable for cold adhesive or hot asphalt application method.
- B. Product: Paradiene 20 by Siplast

## 2.4 STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS CAP SHEET

- A. Granule-Surfaced Roofing Cap Sheet: ASTM D 6163/D 6163M, Type II, Grade G, SBS-modified asphalt sheet, reinforced with fiberglass fabric, suitable for cold adhesive or hot asphalt application method.
  1. Granule Color: Bright White
- B. Product: Paradiene 30 FR BW by Siplast

## 2.5 BASE FLASHING SHEET MATERIALS

- A. Backer Sheet: ASTM D 6163/D 6163M, Type I or II, Grade S, SBS-modified asphalt sheet, reinforced with glass fibers smooth surfaced, suitable for application method specified.
- B. Granule-Surfaced Flashing Sheet: ASTM D 6163/D 6163M, Type II, Grade G, SBS-modified asphalt sheet, reinforced with glass fibers granule surfaced, suitable for application method specified, and as follows:
  1. Product: Paradiene 40 FR BW by Siplast
  2. Granule Color: Bright White
- C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668/D 1668M, Type I.
- D. Liquid Flashing System: Parapro 123 Flashing by Siplast



## 2.6 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
  - 1. Adhesives and Sealants: Comply with VOC limits of NYC Building Code.
  - 2. Bituminous Roof Coatings: Maximum concentration of VOC 300 g/L.
- B. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- C. Roof Vents: As recommended by roof membrane manufacturer.
  - 1. Size: Not less than 4-inch diameter.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel bars, approximately 1 by 1/8 inch thick; with anchors.
- E. Cold-Applied Asphalt Adhesive: PA-311M Adhesive by Siplast. At all locations receiving Parapro 123 flashing, Siplast SFT Adhesive must be used.
- F. Asphalt Roofing Cement: PA-828 by Siplast.
- G. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.
- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- I. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

## 2.7 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate or ASTM C 1278/C 1278M, fiber-reinforced gypsum board.
  - 1. Product: Dens Deck Prime - Thickness: Type X, 5/8 inch.
  - 2. Surface finish: Factory primed.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

## 2.8 VAPOR RETARDER

- A. Self-Adhering-Sheet Vapor Retarder: ASTM D 5147 self-adhesive modified bitumen base ply, 102-mil total thickness; coated with a self-adhesive bitumen layer.

- B. Product: Paradiene 20 SA by Siplast

## 2.9 ROOF INSULATION

- A. General: Preformed roof insulation boards, manufactured by roof membrane manufacturer.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 2, Grade 3, felt or glass-fiber mat facer on both major surfaces, tapered where/as required for positive pitch to drain.
1. Compressive Strength: 25 psi.
  2. Size: 48 by 96 inches.
  3. Thickness:
    - a. Base Layer: 2.6 inches minimum.
    - b. Upper Layer: 2.6 inches minimum.
- C. Sheathing Panel: Dens Deck Prime – Thickness: ¼ inches.

## 2.10 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
1. Modified asphaltic, asbestos-free, cold-applied adhesive.
- D. Insulation Cant Strips: ASTM C 728, perlite insulation board.
- E. Wood Nailer Strips: Comply with requirements in Section 061000 "Rough Carpentry."
- F. Tapered Edge Strips: ASTM C 728, perlite insulation board.
- G. Cover Board: ASTM C 1289, Type II, Class 4, Grade 1, 1/2-inch-polyisocyanurate, having a minimum compressive strength of 80 psi.

## 2.11 ASPHALT MATERIALS

- A. Asphalt Primer: PA-917 LS by Siplast

## 2.12 PROTECTIVE WALKWAY PADS

- A. Product: Paratread by Siplast

Modified Bituminous Membrane Roofing



**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053000 "Metal Decking."
  - 4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions.
  - 1. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
  - 1. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Perform fastener-pullout tests according to roof system manufacturer's recommendations.
  - 1. Submit test result within 24 hours of performing tests.
    - a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.
- D. Install sound absorbing insulation strips in ribs of acoustical roof decks according to acoustical roof deck manufacturer's written instructions.

**3.3 ROOFING INSTALLATION, GENERAL**

- A. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav assembly requirements meeting field wind uplift rating of 60 psf,



perimeter wind uplift rating of 105 psf, corner wind uplift rating of 165 psf, and FM Global Property Loss Prevention Data Sheet 1-29.

- B. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast.
  - 1. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

### 3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
  - 1. At steel roof decks, install substrate board at right angle to flutes of deck.
    - a. Locate end joints over crests of steel roof deck.
  - 2. Tightly butt substrate boards together.
  - 3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - 4. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions.

### 3.5 VAPOR RETARDER INSTALLATION

- A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 and 6 inches, respectively.
  - 1. Extend vertically up parapet walls and projections to a minimum height equal to height of the insulation and cover board.
  - 2. Seal laps by rolling.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

### 3.6 INSULATION INSTALLATION

- A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.



- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Nailer Strips: Mechanically fasten 4-inch nominal-width, wood nailer strips of same thickness as insulation perpendicular to sloped roof deck at the following spacing:
  - 1. 16 feet apart for roof slopes greater than 1 inch per 12 inches (1:12) but less than 3 inches per 12 inches (3:12).
- D. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing system with vertical surfaces or angle changes greater than 45 deg F.
- E. Installation Over Metal Decking:
  - 1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows and with long joints continuous at right angle to flutes of decking.
    - a. Locate end joints over crests of decking.
    - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
    - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
    - d. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
      - 1) Trim insulation, so that water flow is unrestricted.
    - e. Fill gaps exceeding 1/4 inch with insulation.
    - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
    - g. Mechanically attach base layer of insulation and substrate board using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
      - 1) Fasten insulation according to requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.
      - 2) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.
  - 2. Install upper layers of insulation and tapered insulation, with joints of each layer offset not less than 12 inches from previous layer of insulation.
    - a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
    - b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
    - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
    - d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
    - e. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
    - f. Trim insulation, so that water flow is unrestricted.
    - g. Fill gaps exceeding 1/4 inch with insulation.



- h. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- i. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
  - 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

### 3.7 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines, with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
  - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - 2. At internal roof drains, conform to slope of drain sump.
    - a. Trim cover board, so that water flow is unrestricted.
  - 3. Cut and fit cover board tight to nailers, projections, and penetrations.
  - 4. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
    - a. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- B. Install sheathing paper over cover board and immediately beneath roof membrane.

### 3.8 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel and Special Inspection agency.
- C. Where roof slope exceeds 1/2 inch per 12 inches, install roofing membrane sheets parallel with slope.
  - 1. Backnail roofing sheets to substrate according to roofing system manufacturer's written instructions.
- D. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.



1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
2. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.9 BASE SHEET INSTALLATION

- A. Before installing, unroll base sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature.
- B. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches and 6 inches, respectively.
- C. Installation of SBS-Modified Bitumen Polyester and Fiberglass-Mat Base Sheet:
  1. Install base sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.
  2. Extend roofing sheets over and terminate above cants.
  3. Install base sheet in a shingle fashion.
  4. Adhere to substrate in a uniform coating of cold-applied adhesive.
  5. Install base sheet without wrinkles, rears, and free from air pockets.
  6. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.
    - a. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches.
    - b. Stagger end laps not less than 18 inches.
    - c. Completely bond and seal laps, leaving no voids.
    - d. Roll laps with a 20-pound roller.
  7. Repair tears and voids in laps and lapped seams not completely sealed.
  8. Apply pressure to the body of the base sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

### 3.10 INSTALLATION OF INTERPLY SHEETS

- A. Install two ply sheets, starting at low point of roofing.
  1. Align ply sheets without stretching.
  2. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane.
    - a. Shingle in direction to shed water.
  3. Extend ply sheets over and terminate above cants.



3.11 SBS-MODIFIED BITUMINOUS CAP SHEET INSTALLATION

- A. Before installing, unroll cap sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature at which cap sheet will be installed.
- B. Install modified bituminous roofing cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.
  - 1. Extend cap sheet over and terminate above cants.
  - 2. Install cap sheet in a shingle fashion.
  - 3. Install cap sheet as follows:
    - a. Adhere to substrate in cold-applied adhesive.
  - 4. Install cap sheet without wrinkles or tears, and free from air pockets.
  - 5. Install cap sheet, so side and end laps shed water.
- C. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.
  - 1. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches.
  - 2. Stagger end laps not less than 18 inches.
  - 3. Completely bond and seal laps, leaving no voids.
  - 4. Roll laps with a 20-pound roller.
  - 5. Repair tears and voids in laps and lapped seams not completely sealed.
- D. Apply pressure to the body of the cap sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

3.12 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
  - 1. Prime substrates with asphalt primer as required by roofing system manufacturer.
  - 2. Backer Sheet Application:
    - a. Mechanically fasten backer sheet to walls or parapets.
    - b. Adhere backer sheet over roofing membrane at cants in cold-applied adhesive.
    - c. Seal all laps.
  - 3. Backer Sheet Application:
    - a. Adhere backer sheet to substrate in cold-applied adhesive.
    - b. Seal all laps.



4. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate required by roofing system manufacturer.
  - B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.
  - C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
  - D. Install liquid flashing system according to manufacturer's recommendations.
    1. Extend liquid flashing not less than 3 inches in all directions from edges of item being flashed.
    2. Embed granules, matching color of roof membrane, into wet compound.
  - E. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.
  - F. Roof Drains: Set 30-by-30-inch-4-pound lead flashing in bed of asphaltic adhesive on completed roofing membrane.
    1. Cover lead flashing with roofing cap-sheet stripping and extend a minimum of 6 inches beyond edge of metal flashing onto field of roofing membrane.
    2. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.
    3. Install stripping according to roofing system manufacturer's written instructions.

### 3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, roof membrane application, flashings, protection, and drainage components, and to furnish reports to the Commissioner.
- B. Perform the following tests:
  1. Flood Testing: Flood test each roofing area for leaks, according to recommendations in ASTM D 5957, after completing roofing and flashing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
    - a. Perform tests before overlying construction is placed.
    - b. Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and not exceeding a depth of 4 inches. Maintain 2 inches of clearance from top of base flashing.
    - c. Flood each area for 24 hours.
    - d. After flood testing, repair leaks, repeat flood tests, and make further repairs until roofing and flashing installations are watertight.
      - 1) Cost of retesting is the responsibility of the Contractor.



- e. Testing agency shall prepare survey report indicating locations of initial leaks, if any, and final survey report.
2. Testing agency shall prepare survey report indicating locations of initial discontinuities, if any.
- C. Test Cuts: Remove test specimens to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
  1. Determine approximate quantities of components within roofing membrane according to ASTM D 3617/D 3617M.
  2. Examine test specimens for interply voids according to ASTM D 3617/D 3617M and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
  3. Repair areas where test cuts were made according to roofing system manufacturer's written instructions.
- D. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of the Commissioner, and to prepare inspection report.
  1. Notify the Commissioner and the City of New York 48 hours in advance of date and time of inspection.
- E. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- F. Roofing system will be considered defective if it does not pass tests and inspections.
  1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.14 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
  1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to the Commissioner and the City of New York.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION



**SECTION 07 62 00  
SHEET METAL FLASHING AND TRIM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section Includes:

1. Manufactured through-wall flashing with counterflashing.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.

- B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

**1.3 COORDINATION**

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

**1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at District SI-3 Garage, 1000 West Service Road, Staten Island, NY.
1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
  3. Review requirements for insurance and certificates if applicable.
  4. Review sheet metal flashing observation and repair procedures after flashing installation.



1.5 ACTION SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- C. Shop Drawings: For sheet metal flashing and trim.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
  - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
  - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
  - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  - 6. Include details of termination points and assemblies.
  - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  - 8. Include details of roof-penetration flashing.
  - 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
  - 10. Include details of special conditions.
  - 11. Include details of connections to adjoining work.
  - 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- D. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- E. Samples for Verification: For each type of exposed finish.
  - 1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
  - 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
  - 4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 INFORMATIONAL SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Qualification Data: For fabricator.



- C. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested and FM Approvals approved.
- D. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- E. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
  - 1. For copings and roof edge flashings that are SPRI ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1. Build mockup of typical roof edge approximately 10 feet long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless the Commissioner specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.



1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. FM Approvals Listing: Manufacture and install copings and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification. Identify materials with name of fabricator and design approved by FM Approvals.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.



1. Nonpatinated Exposed Finish: Mill.
- C. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
  1. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M Type 304, dead soft, fully annealed; with smooth, flat embossed surface.
  1. Finish: 4 (polished directional satin)

### 2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
  2. Fasteners for Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
  3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder:
  1. For Copper ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
  2. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.



- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

#### 2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Through-Wall, Ribbed, Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry, with ribs at 3-inch intervals along length of flashing to provide integral mortar bond. Manufacture through-wall flashing with snaplock receiver on exterior face to receive counterflashing.
  - 1. Stainless Steel: 0.016 inch thick.

#### 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 2. Obtain field measurements for accurate fit before shop fabrication.
  - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.



1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.
- H. Do not use graphite pencils to mark metal surfaces.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates.
1. Joint Style: Overlapped, 4 inches wide.
  2. Fabricate from the Following Materials:
    - a. Aluminum: 0.050 inch thick.
- B. Copings: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight.
1. Coping Profile: as shown on drawings.
  2. Joint Style: Butted with expansion space and 6-inch-wide, concealed backup plate.
  3. Fabricate from the Following Materials:
    - a. Aluminum: 0.050 inch thick.
- C. Counterflashing: Fabricate from the following materials:
  1. Stainless Steel: 0.019 inch thick.
- D. Flashing Receivers: Fabricate from the following materials:
  1. Stainless Steel: 0.016 inch thick.

## 2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, and at shelf angles. Fabricate discontinuous

lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch-high, end dams. Fabricate from the following materials:

1. Stainless Steel: 0.016 inch thick.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
  1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches Roll laps and edges with roller. Cover underlayment within 14 days.
- D. Apply slip sheet, wrinkle free, over underlayment before installing sheet metal flashing and trim.

#### 3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.



1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
  5. Torch cutting of sheet metal flashing and trim is not permitted.
  6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection:** Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions:** Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners:** Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.**
- F. Seal joints as required for watertight construction.**
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."



- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel and aluminum sheet.
  2. Do not use torches for soldering.
  3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
  5. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
  6. Copper-Clad Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for copper-clad stainless steel.

### 3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch.
  2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.
- D. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.



3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8- offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION



**Department of  
Design and  
Construction**

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**SECTION 07 71 00  
ROOF SPECIALTIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

A. Section Includes:

1. Copings.
2. Roof-edge specialties.
3. Roof drainage systems.
4. Reglets and counterflashings.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 076200 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
3. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

C. Preinstallation Conference: Conduct conference at District SI-3 Garage, 1000 West Service Road, Staten Island, New York 10314.

1. Meet with The City of New York, The Commissioner, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system manufacturer's representative, Installer, structural-support Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.
2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

**1.3 ACTION SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.



1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- C. Shop Drawings: For roof specialties.
1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
  2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
  3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
  4. Detail termination points and assemblies, including fixed points.
  5. Include details of special conditions.
- D. Samples: For each type of roof specialty and for each color and texture specified.
- E. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- F. Samples for Verification:
1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
  2. Include copings, roof-edge specialties, reglets and counterflashings made from 12-inch lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Qualification Data: For manufacturer.
- C. Product Certificates: For each type of roof specialty.
- D. Product Test Reports: For copings and roof-edge flashings, for tests performed by a qualified testing agency.
- E. Sample Warranty: For manufacturer's special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Maintenance Data: For roofing specialties to include in maintenance manuals.



1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class.
- C. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty.
- D. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.
  - 1. Build mockup of typical roof edge as shown on Drawings.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless The Commissioner specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 52 16 Modified Bituminous Membrane Roofing.
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:



- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install coping and roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

### 2.2 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
  1. Extruded-Aluminum Coping Caps: Extruded aluminum, 0.050 inch thick.
    - a. High Performance Organic Finish, Two Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
    - b. Color: to match the color of existing coping, subject to approval by the Commissioner.
  2. Corners: Factory mitered and mechanically clinched and sealed watertight.
  3. Coping-Cap Attachment Method: Snap-on, fabricated from coping-cap material.
    - a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.
    - b. Face-Leg Cleats: Concealed, continuous stainless steel.



2.3 ROOF-EDGE SPECIALTIES

- A. One-Piece Gravel Stops: Manufactured, one-piece, metal gravel stop in section lengths not exceeding 12 feet, with a horizontal flange and vertical leg, terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop. Provide matching corner units.
1. Extruded-Aluminum Gravel Stops: Extruded aluminum, 0.050 inch thick.
    - a. High Performance Organic Finish, Two Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
    - b. Color: As selected by The Commissioner.

2.4 ROOF DRAINAGE SYSTEMS

- A. Provide roof drainage components from the following:
1. Jay R Smith Manufacturing Company, PO Box 3237, Montgomery, AL 36109-0237
  2. Zurn Industries, LLC, 1801 Pittsburgh Avenue, Erie, PA 16502
  3. Watts, 815 Chestnut Street, North Andover, MA 01845
  4. Or approved equal.
- B. Roof Drains: Manufactured Roof Drains, each with low profile dome, and combined flashing clamp and gravel stop, and of dimensions and shape indicated, complete with outlet tube that nests into existing internal drainage system.
1. Cast Iron drain body.

2.5 REGLETS AND COUNTERFLASHINGS

- A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
1. Stainless Steel: 0.025 inch thick.
  2. Masonry Type, Embedded: Provide reglets with offset top flange for embedment in masonry mortar joint.
- B. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
1. Stainless Steel: 0.019 inch thick.
- C. Accessories:
1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.



2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- D. Stainless-Steel Finish: No. 4 (bright, polished directional satin).

## 2.6 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
- B. Aluminum Sheet: ASTM B 209 alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- C. Aluminum Extrusions: ASTM B 221 alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:
- D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.
- E. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.

## 2.7 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  1. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at 240 deg F.
  2. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus 20 deg F
- B. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

## 2.8 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
  1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
  2. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
  3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
  4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
  5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.



- B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- F. Solder for Copper: ASTM B 32, lead-free solder.

## 2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Aluminum Extrusion Finishes:
  - 1. High Performance Organic Finish, Two Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
- E. Copper Sheet Finishes:
  - 1. Non-Patinated Finish: Mill finish.
  - 2. Pre-Patinated Finish: Chemically treated according to ASTM B 882.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
  - 1. Apply continuously under coping, roof-edge specialties, and reglets and counterflashings.
  - 2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.
- B. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- C. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

### 3.3 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
  - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
  - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
  - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
  - 4. Torch cutting of roof specialties is not permitted.
  - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
  - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.



2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

### 3.4 COPING INSTALLATION

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
  1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at 30-inch.
  2. Interlock face-leg drip edge into continuous cleat anchored to substrate at 24-inch centers. Anchor back leg of coping with screw fasteners and elastomeric washers at 24-inch centers.

### 3.5 ROOF-EDGE SPECIALITIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

### 3.6 ROOF DRAINAGE INSTALLATION

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.



1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
  2. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
  3. Torch cutting of roof specialties is not permitted.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
- D. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches.

### 3.7 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Embedded Reglets: Section 04 22 00 "Concrete Unit Masonry" for installation of reglets.
- C. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- D. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

### 3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal



filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION



**Department of  
Design and  
Construction**

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**SECTION 07 81 00**

**SPRAYED FIRE-RESISTIVE MATERIALS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

- A. Provide material, labor, equipment, services to properly install sprayed fire-resistive material (sprayed fireproofing) on steel framing members and deck assemblies at a thickness that will meet the required fire-resistance rating of the 1968 NYC Building Code for Construction Classification Class 1-C.
- B. Provide cementitious type sprayed fireproofing only. The use of sprayed fiber, such as sprayed mineral wool, is not permitted.
- C. Apply manufacturer's recommended latex sealer over all regular weight fireproofing.

1.3 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications
  - 1. Manufacturer: Company specializing in the manufacture of sprayed fire-resistive materials to be used in this Contract shall have a minimum of three years of experience.
  - 2. Applicator: Company specializing in the application of sprayed fireproofing materials shall have a minimum of three years of experience and shall have worked on with similar materials. Applicator shall be properly trained by the sprayed fireproofing material manufacturer.
- C. Regulatory Requirements
  - 1. Building Code: Material and application shall meet the requirements for fire resistance ratings for areas to receive the sprayed fireproofing materials in accordance with the NYC Building Code.



#### 1.4 REFERENCE STANDARDS

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. American Society of Testing and Materials (ASTM) standards, latest editions:
- E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - E119 Standard Methods of Fire Tests of Building Construction and Materials.
  - E605 Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.
  - E736 Standard Test Methods for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E759 Standard Test Methods for the Effect of Deflection on Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E760 Standard Test Methods for the Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E761 Standard Test Methods for the Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E859 Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E937 Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
  - G-21 Standard Test Method to Evaluate Resistance of Synthetic Polymer Materials to Fungi.
- C. Underwriters Laboratories, Inc. (UL) Fire Resistance Directory, latest edition.

#### 1.5 FIRE RESISTANCE REQUIREMENTS

- A. Thickness of the sprayed fireproofing shall be such as to provide required fire rating in accordance with NYC Building Code and Drawings, but in no case less than .375". Thicknesses shall be based on unrestrained assemblies. Ratings are shown on Drawings for members and assemblies.
- B. Fire-resistance rating shall be:



1. Columns, girders, trusses (other than roof trusses) and framing supporting one floor: 1-1/2 hours
2. Columns, girders, trusses (other than roof trusses) and framing supporting more than one floor: 2 hours
3. Beams Supporting more than one floor.: 2 hours
4. Structural Members Supporting a Fire Rated Wall or Partition: 2 hours
5. Floor Construction (Including Beams - those members not part of the structural frame): 2 hours
6. Roof Construction (Including beams, trusses, framing and roof deck) for one-story building: 0 hour
7. Roof Construction (Including beams, trusses, framing and roof deck) for building over one-story high: 1 hour

#### 1.6 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data
  1. Submit manufacturer's product information for each type of material including application instructions and specifications.
- C. Quality Control Submittals
  1. Design Data
    - a. For each type of material, submit thickness of material required to give the proper fire rating for each type of assembly or individual member (such as inner angle of lintel assemblages, bracing members, columns, etc.) as prepared by the manufacturer.
    - b. For assemblies having limiting ratios such as W/D, submit table from the manufacturer listing the member, W/D ratio, and the thickness of material required to give the required fire rating. Ratings shall be based on unrestrained assemblies. Provide manufacturer with complete set of Drawings to enable correct determination of required thickness for all members and assemblies. Indicate areas that require bonding adhesive for the given assemblies.
    - c. From list prepared by manufacturer, provide mark-up of framing plans indicating thickness and type of material for each member.
  2. Certificates (as per 2014 NYC Building Code Section BC 703)
    - a. Furnish manufacturer's certification that materials meet or exceed specification requirements for each of the performance tests specified in Part 2.



- b. Furnish applicator's certification that material has been completed as specified to meet fire resistance ratings, thickness requirements, and application requirements.
- c. Furnish UL or OTCR approval of material.
- d. Furnish certificate stating each material is 100% asbestos free.

3. Contractor Qualifications

1. Provide proof of Manufacturer and Applicator qualifications specified under "Quality Assurance".

D. Guarantee

1. Contractor and installer's installation guarantee.

E. Low Emitting Materials Compliance Submittals.

1. Provide documentation for each sealer to be used on site, indicating that the sealers comply with low V.O.C. requirements.
2. Material must have UL or OTCR approval for each fire-tested assembly utilized.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packages bearing name of manufacturer, product identification, and the proper UL labels for fire hazard and fire-resistance classification.
- B. Reject damaged packages found unsuitable for use and remove from job site.
- C. Store materials off ground, under cover, and away from damp surfaces.
- D. Keep materials dry at all times. Wet material shall be discarded.
- E. Rotate stock material and use prior to expiration date.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain air and substrate temperature at a minimum temperature of 40°F for 24 hours before, during, and for 24 hours after application of the sprayed fireproofing. Contractor shall provide enclosures with heat to maintain temperatures. If the manufacturer's accelerator is used for regular density material with proper application equipment, these may be adjusted to their written recommendations.



1.9 GUARANTEE

- A. Submit a guarantee, executed by the Contractor and co-signed by the installer, agreeing to restore/replace fireproofing work performed under this Contract which has cracked, flaked, dusted excessively, peeled, or has fallen from the substrate due to defective workmanship for a period of one year from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer of the fireproofing material is required to have the material for the required fire ratings of all assemblies and individual members used on this project listed and labeled by UL, or have MEA, BSA, or OTCR approval.
1. W.R. Grace & Co. 62 Whittemore Avenue, Cambridge, Mass.
  2. Isolatek International, Furnace St, Stanhope, NJ
  3. Pyrok, Inc., Mamaroneck, NY
  4. Or approved equal

2.2 MATERIALS

- A. Medium Density Sprayed Fire-resistive Material
1. Material
    - a. Material shall be of the cementitious type (Portland cement based) with a density of at least 20 pcf (medium density). The use of sprayed fiber (such as sprayed mineral wool) is not permitted.
    - b. Products
      - 1) Monokote Type Z-106 by W.R. Grace.
      - 2) Cafco 400 by Isolatek International
      - 3) CV 25 by Pyrok, Inc.
      - 4) Or approved equal
  3. Material shall comply with the following performance test criteria, which shall be tested and reported by UL or approved lab in accordance with the procedures of ASTM E119:



- a. Density: Dry density of material shall a minimum of 20 lb/ft<sup>3</sup> or as listed in the UL approval, whichever is greater. No reduction in average thickness is permitted when the density given in the approval is less than 20 lb/ft<sup>3</sup> and provides the required fire resistance.
- b. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E759.
- c. Bond Impact: Material subject to impact tests in accordance with ASTM E760 shall not crack or delaminate from the surface to which it is applied.
- d. Bond Strength: Fireproofing, when tested in accordance with ASTM E736, shall have a minimum average bond strength of 1000 psf and a minimum individual bond strength of 750 psf.
- e. Air Erosion: Maximum allowable weight loss of the fireproofing material within a 24 hour period shall be 0.005 gm/ft<sup>2</sup> when tested in accordance with ASTM E859.
- f. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to compressive forces of 10000 psf when tested in accordance with ASTM E761.
- g. Corrosion Resistance: Steel with applied fireproofing shall be tested in accordance with ASTM E937 and shall not promote corrosion of steel.
- h. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84.
  - 1) Flame Spread.....0
  - 2) Smoke Development.....0

- 3. Material shall not contain Asbestos of any form.
- 4. Material shall be tested in accordance with ASTM Standard G-21 and shall show resistance to mold growth when inoculated with aspergillus niger and mixed spore cultures (Tappi T487-M54 and ASTM G-21). Mold inhibitor shall be added by the manufacturer.

**B. Sealer**

**1. Material**

- a. Sealer is to be a water-based latex material compatible with the sprayed fire-resistive material, providing a firmer surface for regular-density fireproofing material. Sealer is to be either factory tinted or tinted in field.



- a. Sealer is to be a water-based latex material compatible with the sprayed fire-resistive material, providing a firmer surface for regular-density fireproofing material. Sealer is to be either factory tinted or tinted in field.
2. Product
    - a. Firebond Concentrate by WR Grace, with green tint added in field
    - b. Bond Seal with green tint added in field, or Bond-Seal Type X by Cafco
    - c. Isolatek SBK-113 by Isolatek with green tint added in field
    - d. Or approved equal
- C. Water
    1. Shall be clean potable water free of injurious foreign matter conforming to the requirements of Section BC 1903.4 of the 2008 NYC Building Code.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Surfaces to receive sprayed fireproofing shall be free of oil, grease, dirt, paints/primers, loose materials, and other matter that may impair proper adhesion of the fireproofing material to the substrate. Do not begin application of fireproofing until the substrate is acceptable to receive the fireproofing material. Confirm that the substrate temperature is acceptable. Notify the Commissioner in writing of any conditions that will prevent the proper completion of the Work. Beginning of installation means applicator accepts existing substrate.

#### 3.2 PREPARATION

- A. Protection
  1. Provide ventilation in area to receive sprayed fireproofing, introducing fresh air and exhausting air continuously during, and 24 hours after, application to promote the evaporation of water and optimum drying of applied material. Material must be substantially dry within 30 days of application.
  2. Provide temporary enclosures to contain overspray.
  3. Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting-off of sprayed fireproofing materials. Protect concrete and masonry surfaces exposed to view from overspray by using masks, drop cloths, or other satisfactory coverings.



4. Provide fire extinguisher and post caution signs warning against smoking and open flame when working with flammable materials.
5. Prevent entry by non-fireproofing personnel into spraying and mixing areas or other areas exposed to the wet material. Post signs such as "Slippery When Wet".

**B. Surface Preparation**

1. After acceptance of surfaces, maintain substrate clean of dirt, dust, grease, oil, loose material, frost, or other matter that would affect bond of sprayed fireproofing.
2. Clips, hangers, supports, sleeves, and other items required to penetrate the sprayed fireproofing shall be in place before installing fireproofing.
3. Ducts, piping, equipment, or other items that would interfere with application of fireproofing shall not be positioned until sprayed fireproofing work is completed.
4. Prior to application of fireproofing to the underside of metal deck, concrete work above shall be complete.

**3.3 APPLICATION**

- A. Conform to the material manufacturer's application instructions for equipment and application procedure.
- B. Patch and restore sprayed fireproofing surfaces damaged by other trades. Payment for such is the responsibility of the trades responsible for such damage.
- C. Correct unacceptable work as determined by the Special Inspector and the Commissioner and pay for further testing required to prove acceptability of installation.
- D. Patch areas from which testing samples have been removed to satisfy fire-rating testing requirements.

**3.4 FIELD QUALITY CONTROL**

**A. Tests**

1. The City of New York's engaged testing laboratory will verify thickness and dry density of in-place material in accordance with ASTM E605 and verify bond strength in accordance with ASTM E736.
2. Inspections and tests to be done by the testing laboratory as work progresses are as follows.
  - a. Visual inspection of substrate prior to application of fireproofing to verify surface preparation. Visual inspection of material installed to check if material is properly applied or is actually overspray.



b. Thickness

- 1) Thickness of sprayed fireproofing applied to floor and roof assemblies will be by taking the average of not less than four measurements for each 1,000 square feet, or portion thereof, of sprayed area in each story (for each hourly rating and material) in accordance with Section BC 1704.11.3.1. Test locations will be selected at random.
- 2) Thickness of sprayed fireproofing applied to structural framing members will be performed on not less than 25% of the structural members in each story in accordance with Section BC 1704.11.3.2. Test locations will be selected at random.

c. At least one density test on both beams and columns for every 10,000 sq. ft. of floor area, or portion thereof, with a minimum of 6 tests per floor (3 for beam, 3 for column) for each days work.

d. Bond Strength

- 1) Bond strength of sprayed fireproofing applied to floor and roof assemblies will be by taking the average of not less than one sample for each 10,000 square feet, or portion thereof, of sprayed area in each story (for each hourly rating and material) in accordance with Section BC 1704.11.5.1 for each days work. Test locations will be selected at random.
- 2) Bond strength of sprayed fireproofing applied to structural framing members will be performed on not less than one type of structural framing member (for each hourly rating and material) for each 10,000 SF, or portion thereof, in each story in accordance with Section BC 1704.11.5.2 for each days work. Test locations will be selected at random.
- 3) Bond strength is to consist of a minimum of two tests done at each location, with one being the top of the bottom flange. For steel deck locations, bond strength shall consist of a minimum of two tests done at each location, one being at the top of the flute and one being at the bottom of the flute.

e. Visual inspection of completed work including patches to cracking and spalling.

B. Inspection

1. Testing Laboratory

- a. The City of New York will engage an approved Testing Laboratory or Special Inspection Agency to inspect and perform the above tests.
  - b. The Testing Laboratory will be responsible to and under the supervision of Special Inspector.
2. Special Inspector
- a. The City of New York will assign, under the requirements of Section BC 1704.11 of the 2008 NYC Building Code, a Special Inspector to supervise the testing of the sprayed fireproofing. The Special Inspector will ensure all required testing is done and that application and substrate temperatures are per the specifications and manufacturer's instructions, which ever is more stringent.
3. Test Results: Results of above tests will be made available to all parties on a regular basis.
4. When test results indicate fireproofing does not comply with the Contract requirements, additional random testing will be done within the testing area to determine the extent of noncompliance. This additional testing shall be paid for by the Contractor at no additional cost to the City of New York.
- C. Nonconforming Fireproofing
1. When test results indicate fireproofing does not comply with the required density and/or bond strength, remove and replace fireproofing at no cost to the City of New York.
  2. If fireproofing is less than the required thickness, place additional material in accordance with the manufacturer's recommendations.
  3. Areas of restore or replacement will be retested for compliance with the Specifications.
- 3.5 CLEANING
- A. After completion of fireproofing work clean other surfaces not to be sprayed of any applied fireproofing material.
- 3.6 PROTECTION
- A. Protect applied fireproofing until permanent covering is installed or, where exposed, until final acceptance.

END OF SECTION

**SECTION 07 92 00**  
**JOINT SEALANTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the work of sealants as shown on the Drawings, specified herein, and as required by conditions and NYC Department of Buildings, including, but not limited to, sealants for the following applications:

1. Exterior joints in the following vertical surfaces:

- a. Joints between masonry materials.  
b. Joints between masonry and metal flashing.  
c. Other joints as indicated.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 07 62 00 – “Sheet Metal Flashing and Trim”

**1.3 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
1. Perform sealing only with workers skilled in techniques of sealant installation who are completely familiar with current published recommendations of manufacturer of sealant being used.



2. Indication of lack of skill on part of sealant installers shall be sufficient grounds for Commissioner to reject installed sealant and to require Contractor to remove all installed sealants, provide proper joint preparation acceptable to manufacturer, and reinstall sealants at no additional cost to the City of New York.
- C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:
1. Locate test joints where indicated or, if not indicated, as directed by Commissioner.
  2. Conduct field tests for each application indicated below:
    - a. Each type of elastomeric sealant and joint substrate indicated.
  3. Notify Commissioner 48 hours in advance of dates and times when test joints will be erected.
  4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
  5. Test Method: Test joint sealants by hand-pull method described below:
    - a. Install joint sealants in 60-inch- long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
    - b. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2-inch piece.
    - c. Use fingers to grasp 2-inch piece of sealant between cross-cut end and 1-inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler alongside of sealant. Pull sealant out of joint to distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
    - d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.



6. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

#### 1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. General: Submit each item in this Article in compliance with the Conditions of the Contract and General Conditions. Revise and resubmit each item as required to obtain Commissioner's approval.
- C. Qualification Data: Qualification data for firm and personnel specified in "Quality Assurance" Article that demonstrates that both firm and personnel have capabilities and experience complying with requirements specified.
- D. Product Literature: Manufacturer's published technical data for each product to be used in work of this Section including recommendations for application and use. Include test reports and certificates verifying that product complies with specified requirements.
- E. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- F. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- G. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for use indicated.
  1. Include certification that products are non-staining on substrates indicated.
- H. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- I. Field Test Report Log: For each elastomeric sealant application.
- J. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:



1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

K. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.

L. Warranties: Special warranties specified in this Section.

M. Preinstallation Conference: Conduct conference at Project site to comply with requirements of the Contract Documents.

### 1.5 MOCKUPS

A. General: Before beginning general joint sealant work, prepare mockups to verify selections made under sample Submittals, to demonstrate aesthetic effects and qualities of materials and execution, and to provide standards for work of this Section. Do not proceed with installation of joint sealants until Commissioner has accepted mockups.

1. Locate mockups as directed by Commissioner.
2. Provide 48 hours notice to Commissioner prior to start of each mockup.
3. Commissioner will monitor mockups.
4. Perform mockups using crew that will be executing the work and following requirements of this Section.
5. Repeat mockups as necessary to obtain Commissioner's approval.
6. Protect approved mockups to ensure that they are without damage, deterioration, or alteration at time of Substantial Completion.
7. Approved mockups in undamaged condition at time of Substantial Completion may be incorporated into the Work.
8. Approved mockups will represent the minimum acceptable standard for joint sealant work. Subsequent joint sealant work that does not meet standard of approved mockups will be rejected.

B. Mockups: Provide the following mockups:

1. Joint in Flashing Reglet: One joint, minimum 6 ft. long.
2. Joint in GFRC cornice and other GFRC components at cornice level as indicated, minimum 6. ft. long (each).
3. Joint at surround of new window louvers, minimum one (1) full assembly.

### 1.6 DELIVERY, STORAGE, AND HANDLING



- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

#### **1.7 PROJECT CONDITIONS**

- A. Environmental Limitations: Install joint sealants only when sealant temperature, ambient temperature, and substrate temperatures are all within middle two-thirds of temperature range recommended for installation by sealant manufacturer or between 50 deg Fahrenheit and 85 deg Fahrenheit, whichever requirements are more restrictive, and are forecast to remain within this range until sealant has cured.
- B. Joint-Width Conditions: Install joint sealants only where joint widths are within the range recommended by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Install joint sealants only under the following conditions:
  - 1. When joint substrates are free of contaminants capable of interfering with adhesion.
  - 2. When joint substrates are dry.

#### **1.8 WARRANTY**

- A. Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Twenty (20) years from date of Substantial Completion.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS, GENERAL**



- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Commissioner from manufacturer's full range of colors for this type of sealant.

## 2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are to be applied to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. General Building Sealant (Exterior Joints, Unless Otherwise Indicated): Low-modulus, high-performance, single-component, non-sag, gun-grade, non-staining, polyurethane-based elastomeric sealant complying with requirements of ASTM C 920, Type S, Grade NS, Class 25 (with movement capability of +100 percent/-50 percent), use T, NT, G, M. Provide in a standard color to match adjacent masonry or sheet metal produced by one of the following:
  - 1. Sikaflex-15 LM sealant, as manufactured by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071.
  - 2. *Dow Corning* 795 Silicone Building Sealant, as manufactured by Dow Corning Corporation, Corporate Center, PO Box 994, Midland, MI 48686-0994.
  - 3. Sonolastic NP 1 sealant, as manufactured by BASF Construction Chemicals, LLC – Building Systems 889 Valley Park Drive Shakopee, MN, 55379.
  - 4. Or Approved Equal.
- D. Primer: Provide primer where manufacturer recommends or preconstruction testing indicates for optimal adhesion of sealant.

## 2.3 LATEX JOINT SEALANTS

- A. Latex Sealant Standard: Comply with ASTM C 834.

## 2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C, closed-cell material with a surface skin, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.



- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for optimal adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
  - 1. Remove from joint substrates all foreign material that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, and surface dirt.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant



manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with requirements specified herein and joint sealant manufacturer's written installation instructions for products and applications indicated. In case of conflict, the more stringent and restrictive requirement shall govern.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
- E. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses provided for each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealants from surfaces adjacent to joint.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.

**3.4** CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

**3.5** PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

**END OF SECTION**



**Department of  
Design and  
Construction**

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**SECTION 08 11 13  
HOLLOW METAL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the work of steel doors and frames as shown on the Drawings, specified herein, and as required by conditions and NYC Construction Codes, including, but not limited to, the following:

1. Fire-rated door and frame assemblies.

**1.3 DEFINITIONS**

- A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. General: Submit each item in this Article in compliance with the Conditions of the Contract and DDC General Conditions. Revise and resubmit each item as required to obtain Commissioner's approval.
- C. Product Data: For each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.
- D. Shop Drawings: Show the following:
1. Elevations of each door design.
  2. Details of doors including vertical and horizontal edge details.
  3. Frame details for each frame type including dimensioned profiles.



4. Details and locations of reinforcement and preparations for hardware.
  5. Details of each different wall opening condition.
  6. Details of anchorages, accessories, joints, and connections.
- E. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.

#### 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to NYC Department of Buildings, for fire-protection ratings indicated, based on testing according to NFPA 252.
  1. Test Pressure: Test at pressure as required.
  2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to NYC Department of Buildings that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
  3. Temperature-Rise Rating: Where indicated, provide doors that have a temperature-rise rating of 450 deg F maximum in 30 minutes of fire exposure.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Commissioner. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/2-inch spaces between stacked doors to permit air circulation.



## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames by one of the following or approved equal:
1. Amweld Building Products, Inc.
  2. Ceco Door Products; a United Dominion Company.
  3. Curries Company.
  4. Kewanee Corporation (The).
  5. Republic Builders Products.
  6. Steelcraft; a division of Ingersoll-Rand.
  7. Or approved equal

### **2.2 MATERIALS**

- A. Hot-Rolled Steel Sheets: ASTM A 569, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A 366, Commercial Steel (CS), or ASTM A 620, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.
- C. Metallic-Coated Steel Sheets: ASTM A 653, Commercial Steel (CS), Type B, with an A40 zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.

### **2.3 DOORS**

- A. General: Provide doors of sizes, thicknesses, and designs indicated.

### **2.4 FRAMES**

- A. General: Provide steel frames for doors and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.
- B. Frames of 0.053-inch- thick steel sheet for Level 2 steel doors.
- C. Frames of 0.067-inch- thick steel sheet for Level 3 steel doors.
- D. Panels: Provide same material and gage as adjacent door.



- E. Supports and Anchors: Fabricated from not less than 0.042-inch-thick, electrolytic zinc-coated steel sheet.
  - 1. Wall Anchors in Masonry Construction: 0.177-inch-diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.
- F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153, Class C or D as applicable.

## 2.5 FABRICATION

- A. General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B. Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.
- C. Clearances for Fire-Rated Doors: As required by NFPA 80.
- D. Door-Edge Profile: Bevel edge at strike side.
- E. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- F. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- G. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- H. Thermal-Rated (Insulating) Assemblies: At exterior locations, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
  - 1. Unless otherwise indicated, provide thermal-rated assemblies with U-value of 0.41 Btu/sq. ft. x h x deg F or better.
- I. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.
- J. Frame Construction: Fabricate frames to shape shown.



1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints, unless otherwise indicated.
2. Provide welded frames with temporary spreader bars.
3. Provide terminated stops, unless otherwise indicated.

K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

## 2.6 FINISHES

- A. Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.
1. Provide at least three completed opening anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
  2. Install fire-rated frames according to NFPA 80.
  3. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.
- C. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
1. Fire-Rated Doors: Install within clearances specified in NFPA 80.

### 3.2 ADJUSTING AND CLEANING

- A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.



- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION



**SECTION 08 64 00  
SKYLIGHT**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract]

**1.2 DESCRIPTION OF WORK**

- A. Provide skylight at location indicated on Drawings and as specified herein.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals
- B. Shop Drawings: Show fabrication details and connections to adjacent Work.
- C. Product Data: Manufacturer's catalog sheets, specifications, and installation instructions for each item specified.
- D. Contract Closeout Submittals:
1. Maintenance Data: Deliver 2 copies, covering the installed products, to the Commissioner.

**1.3 WARRANTY**

- A. Special Warranty: Manufacturer warrants against defects in materials for a period of ten (10) years and warrants against leaking for a period of ten (10) years from the date shipped.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Barrel Vault Unit Skylights: Factory assembled continuous barrel-vaulted acrylic skylight units; complete with extruded aluminum thermally broken frame system with integral drainable condensation gutters and counter flashing to roof curb by:
1. Bristolite Skylights, 401 East Goetz Ave., P.O. Box 2515, Santa Ana, CA 92707, (800) 854-8618, (714) 540-8950



2. Wasco Skylights, 85 Spencer Drive, Unit A, PO Box 559, Wells, ME 04090, (800) 388-0293
  3. Plasteco, 8535 Market Street, Houston, TX 77029, (855) 580-5590, (713) 396-5082
  4. Or approved equal
- B. Size: Closest manufacturers standard size to match existing skylight size, compatible with roof curb.
- C. Skylight shall have U-factor of less than or equal to 0.5 and a maximum Solar Heat Gain Coefficient (SHGC) of 0.4.

## 2.2 FABRICATION

- A. Fabricate skylights weathertight and free of visual distortion.

## **PART 3 EXECUTION**

### 3.1 INSTALLATION

- A. Install skylights in accordance with the manufacturer's printed instructions. Coordinate with the installation of the roofing system and related flashings. Provide weathertight installation.

END OF SECTION



**SECTION 08 71 00  
DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section includes:
1. Mechanical door hardware for the following:
    - a. Swinging doors.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- C. Samples for Initial Selection: For plastic protective trim units in each finish, color, and texture required for each type of trim unit indicated.
- D. Samples for Verification: For exposed door hardware of each type required, in each finish specified, prepared on Samples of size indicated below. Tag Samples with full description for coordination with the door hardware schedule. Submit Samples before, or concurrent with, submission of door hardware schedule.
1. Sample Size: Full-size units.
    - a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
- E. Other Submittals:
1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate



final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

- a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
  - b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
  - c. Content: Include the following information:
    - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
    - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
    - 4) Fastenings and other pertinent information.
    - 5) Explanation of abbreviations, symbols, and codes contained in schedule.
    - 6) Mounting locations for door hardware.
2. Keying Schedule: Prepared by or under the supervision of Installer, refer to DDC General Conditions for detailing City of New York's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

F. Qualification Data: For Installer.

G. Warranty: Special warranty specified in this Section.

H. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

#### 1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Installer Qualifications: Supplier of products and an employer of workers instructed and approved by product manufacturers.



1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
- E. Smoke-and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
  1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.
- F. Accessibility Requirements: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design for door hardware on doors in an accessible route.
  1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf
  2. Comply with the following maximum opening-force requirements:
    - a. Fire Doors: Minimum opening force allowable by NYC Building Code.
  3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high
  4. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.
- G. Keying Conference: Conduct conference at Project site. In addition to Commissioners, and Contractor, conference participants shall also include Commissioner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
  1. Requirements for key control system.
  2. Requirements for access control.
- H. Preinstallation Conference: Conduct conference at Project site.
  1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.



2. Inspect and discuss preparatory work performed by other trades.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys to manufacturer of key control system for subsequent delivery to Commissioner.
- D. Deliver keys and permanent cores to Commissioner by registered mail or overnight package service.

1.6 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Set anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Commissioner's security consultant.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of doors and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.



**PART 2 - PRODUCTS**

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" Article to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.

2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  - 1. Provide Hinges from one of the following:
    - a. Stanley Commercial Hardware  
480 Myrtle St  
  
New Britain, CT 06053  
  
800-622-493
    - b. Baldwin Hardware Corp.  
841 E. Wyomissing Blvd  
  
Reading, PA 19612  
  
215-777-7811
    - c. Hager Companies  
139 Victor St  
  
St. Louis, MO 63157-0300  
  
800-325-9995



d. Or approved equal.

2.3 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
  - 1. Bored Locks: Minimum 1/2-inch latchbolt throw.
  - 2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
- C. Lock Backset: 2-3/4 inches, unless otherwise indicated.
- D. Lock Trim:
  - 1. Description: As indicated on the hardware schedule in Part 3.
  - 2. Levers: Cast.
  - 3. Escutcheons (Roses): Cast.
  - 4. Operating Device: Lever with escutcheons (roses).
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- F. Mortise Locks: BHMA A156.13; Security Grade 1; stamped steel case with steel or brass parts; Series 1000.
  - 1. Provide Locks from one of the following:
    - a. Sargent Manufacturing  
100 Sargent Drive  
  
New Haven, CT 06563-0915  
  
800-727-5477
    - b. Corbin Russwin Inc.  
PO Box 25288



Charlotte, NC 28229-8010

704-283-2101

- c. Best Access Systems  
6161 East 75<sup>th</sup> Street

Indianapolis, IN 46250

317-849-2250

- d. Or approved equal.

#### 2.4 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  - 1. Manufacturer: Same manufacturer as for locking devices.
- B. High-Security Lock Cylinders: BHMA A156.30; Grade 1; Type M, mechanical; permanent cores that are removable; face finished to match lockset.

#### 2.5 KEYING

- A. Refer to DDC General Conditions for detailing City of New York's final keying instructions for locks.
- B. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  - 1. Existing System:
    - a. Master key locks to City of New York's existing system.
- C. Keys: Brass.
  - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "DO NOT DUPLICATE."
  - 2. Quantity: In addition to one extra key blank for each lock, provide the following:
    - a. Cylinder Change Keys: Three.
    - b. Master Keys: Five.



2.6 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.

2.7 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Provide Closers from one of the following:

- a. Stanley Commercial Hardware  
480 Myrtle St  
  
New Britain, CT 06053  
  
800-622-493
- b. Rixson Specialty Door Controls  
Monroe, NC  
  
800-457-5670
- c. Corbin Russwin Inc.  
PO Box 25288  
  
Charlotte, NC 28229-8010  
  
704-283-2101
- d. Or approved equal.

2.8 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Provide Touch Bar Exit Device from one of the following:



- a. SARGENT Manufacturing Company  
100 Sargent Drive  
  
P.O. Box 9725  
  
New Haven, CT 06536-0915
- b. Yale Security Inc; an ASSA ABLOY Group company  
P.O. Box 25288  
Charlotte NC 28229-8010
- c. Stanley Commercial Hardware  
480 Myrtle St  
  
New Britain, CT 06053  
  
800-622-493
- d. Or approved equal

2. All exit devices shall be of touch bar design and be operative over 2/3 of the door's clear opening width
3. All exit devices must be listed under "panic Hardware" in the Accident Equipment List of Underwriter's Laboratories, Inc. Where labeled doors are used as exits, they must be equipped with labeled Fire Exit Hardware
4. All springs shall be of stainless steel.
5. All exit devices shall be of chassis mounted until construction with removable cover.

2.9 FABRICATION

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Commissioner.
  1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.



- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
  2. Fire-Rated Applications:
    - a. Wood or Machine Screws: For the following:
      - 1) Hinges mortised to doors or frames
      - 2) Strike plates to frames.
      - 3) Closers to doors and frames.
    - b. Steel Through Bolts: For the following unless door blocking is provided:
      - 1) Surface hinges to doors.
      - 2) Closers to doors and frames.
      - 3) Surface-mounted exit devices.
  3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
  4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
  5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## 2.10 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not

acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

#### **3.3 INSTALLATION**

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with NYC Building Code.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  - 2. Custom Steel Doors and Frames: HMMA 831.
- B. Install each door hardware item to comply with manufacturer's 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. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.



- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Replace construction cores with permanent cores as directed by Commissioner.
  - 2. Furnish permanent cores to Commissioner for installation.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant
- F. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.4 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.
  - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of NYC Building Code.
- B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

### 3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

### 3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to instruct Commissioner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.



3.7 DOOR HARDWARE SCHEDULE

DOOR NO:	TYPE	ACTION	DOOR MAT.	FRAME MAT.	HARDWARE				
					DOOR CLOSER	HINGE	SADDLE	DOOR STOP	MISC.
First Floor									
1	Rated	Single Leaf	Hollow Metal	Hollow Metal / Mortar Filled	Surface Mounted Door Closer	Three (3) Tamperproof Stainless Steel Hinges	Aluminum w/ Smoke Seal	Overhead Stop without Holder	Panic Hardware with Rim Cylinder
2	Rated	Single Leaf	Hollow Metal	Hollow Metal / Mortar Filled	Surface Mounted Door Closer	Three (3) Tamperproof Stainless Steel Hinges	Aluminum w/ Smoke Seal	Overhead Stop without Holder	Panic Hardware with Rim Cylinder
3	Rated	Single Leaf	Hollow Metal	Hollow Metal / Mortar Filled	Surface Mounted Door Closer	Three (3) Tamperproof Stainless Steel Hinges	Aluminum w/ Smoke Seal	Overhead Stop without Holder	Panic Hardware with Rim Cylinder, Door Pull and Push Plate

END OF SECTION



**Department of  
Design and  
Construction**

FMS No. S136-383S  
Issue Date 06/05/2019

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*District SI-3 Garage and Repair Shop  
HVAC System and Roof Replacement*

Door Hardware  
08 71 00 - 14



**SECTION 09 29 00**

**GYPSUM BOARD**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Interior gypsum board.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
- C. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
- D. Samples for Initial Selection: For each type of trim accessory indicated.
- E. Samples for Verification: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Mockups: Build mockups of at least 20 sq. ft. in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
  - 1. Build mockups for the following:
    - a. One (1) partition around piping as indicated on the plans.



2. Apply or install final painting on exposed surfaces for review of mockups.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
  1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**PART 2 - PRODUCTS**

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.
- B. Gypsum Wallboard is also available in 1/4- and 3/8-inch thicknesses for limited applications.



1. Thickness: 5/8 inch, Type X
2. Long Edges: Tapered.
- C. Acoustically Enhanced Gypsum Board: ASTM C 1396/C 1396M. Multilayer products constructed of two layers of gypsum boards sandwiching a viscoelastic sound-absorbing polymer core.
  1. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
    - a. National Gypsum Company.
    - b. Quiet Solution.
    - c. Temple-Inland Building Products by Georgia-Pacific.
    - d. Or approved equal
  2. Core: 5/8 inch, regular type.
  3. Long Edges: Tapered.

#### 2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet
  2. Shapes:
    - a. Cornerbead.

#### 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.



2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use all-purpose compound.
  - a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  1. Laminating adhesive shall have a VOC content of 50g/L or less.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
  1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical



joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

- D. Form control and expansion joints with space between edges of adjoining gypsum panels.
- E. Cover both faces of support framing with gypsum panels in concealed spaces except in chases braced internally.
  - 1. Fit gypsum panels around ducts, pipes, and conduits.
  - 2. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  - 1. Wallboard Type: Vertical surfaces unless otherwise indicated.
- B. Multilayer Application:
  - 1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
  - 2. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Commissioner for visual effect.
- C. Interior Trim: Install in the following locations:



1. Cornerbead: Use at outside corners

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

### 3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

**SECTION 09 51 00**  
**ACOUSTICAL CEILINGS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 DESCRIPTION OF WORK**

- A. Provide acoustical ceiling Work as indicated on Drawings and as specified herein, including the following:
1. Acoustical Mineral Fiber Tile and Panel Ceilings.
    - a. Lay-in panel installation - exposed grid

**1.3 REFERENCES**

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. American Society for Testing and Materials (ASTM), latest edition.
- |       |   |
|-------|---|
| C423  | Test Method for Sound Absorption and Sound Absorption Coefficient by the Reverberation Room Method. |
| C635  | Metal Suspension System for Acoustical Tile and Lay-In Panel Ceilings.                              |
| C636  | Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.             |
| D1779 | Specification for Adhesion for Acoustical Materials   |
| E84   | Surface Burning Characteristics of Building Materials.  |
| E90   | Standard Test Method for Laboratory Sound Transmission Class  |
| E119  | Method for Fire Tests of Building Construction and Materials.                                       |
| E413  | Determination of Sound Transmission Class   |



- E1264 Standard Classification for Acoustical Ceiling Products.
- E1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a common Ceiling Plenum (CAC)
- E1477 Standard Test Method for Luminance Reflectance Factor (LR) LR1 >75%
- C. AMA -1-II Ceiling Sound Transmission Test By Two-Room Method
- D. Underwriters Laboratories Inc. (UL) Fire Resistance Directory
- E. Acoustical and Insulation Materials Association, "Job Conditions".
- F. New York City Building Code.

#### 1.4 DEFINITIONS

- A. Direct Suspension System
  - 1. Directly fastened to floor or roof construction above.
- B. Indirect Suspension System
  - 1. Installed as part of the Work of this Section, as furnished by ceiling system manufacturer to be attached to direct suspension system.

#### 1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data
  - 1. Submit manufacturer's product specifications and installation instructions for ceiling materials, indicating compliance with applicable requirements. Include information pertaining to fire performance, flame spread, and smoke development.
- C. Shop Drawings
  - 1. Submit shop drawing details indicating the relationship to mechanical and electrical Work and other items penetrating or connected to the ceiling. Indicate framing and support details for the ceiling Work.
  - 2. Acoustical Panel Ceilings



- a. Submit large scale details indicating how ceiling mounted items such as lighting fixtures and HVAC diffusers are installed.
- b. Submit ceiling plans for coordination with mechanical trades. Indicate which panels are to be installed without retainer clips, to enable service and maintenance access.

**D. Samples**

1. Submit samples of the following materials, prior to installation;
  - a. Acoustical panels: 6"x6" samples of each type, pattern and color.
  - b. Lay-in mineral fiber acoustical panel with field cut tegular edge on one edge, painted to match factory tegular edges. The other three edges shall have manufactured tegular profile: 12" x 24" sample.
  - c. Exposed runners and moldings: 8" long samples of each color and system type required.
2. Forward each approved sample type to Mechanical Installer for purpose of matching diffusers.

**E. Quality Assurance Submittals**

1. Certification and listing by an Approved Agency in accordance with NYC Dept. of Buildings rules, indicating that the materials and assemblies regulated by the NYC Building Code are acceptable for the intended use. When test methods are stipulated in the NYC Building Code, the tests utilized shall be stated in the Certification.

**F. Project Closeout Submittals**

1. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals
2. Guarantee

**G. Low Emitting Materials Compliance Submittals:**

1. Provide documentation for each sealant and adhesive to be used indicating that the sealants and adhesives comply with New York City V.O.C. requirements.

**1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



B. Qualifications

1. Installer is to be a firm with not less than three years of successful experience in the installation of specified materials.

C. Regulatory Requirements

1. Building Code: Work of this Section shall conform to all requirements of the N.Y.C. Building Code.
2. Certification and listing by an Approved Agency in accordance with NYC Dept. of Buildings rules.

D.. Fire Performance Characteristics

1. Provide ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method, by UL or other testing and inspecting agency acceptable to NYC Department of Buildings. Identify ceiling components with appropriate marking of applicable testing and inspecting agency.
2. Surface Burning Characteristics: Tested per ASTM E84. Tested surfaces shall be the surfaces facing the occupied space.
  - a. Flame Spread: 25 or less.
  - b. Smoke Developed: 25 or less.
3. All materials exposed to the airflow in ceiling cavity plenums used for supply, return, or exhaust air shall be non-combustible or have a maximum smoke developed index/rating of 50, as defined by and in accordance with NYC Construction Code Sections BC 719 and MC 602. Flame spread index shall not exceed 25. Tested surfaces shall be the surfaces facing the plenum.

E. Fire Resistance Ratings

1. When the drawings indicate that the acoustical ceiling construction is part of a fire-rated floor/ceiling or roof/ceiling assembly, provide certification by an Approved Agency, in accordance with NYC Dept. of Buildings rules, indicating approval of the ceiling for use in the assembly described.

F. Coordination of Work

1. Coordinate layout and installation of ceiling units and suspension system components with other work above, supported by, or penetrating through ceilings, including light fixtures, HVAC equipment, fire-suppression systems and partitions. Resolve all discrepancies and conflicts prior to start of Work.

G. Pre-installation Meeting

1. Prior to start of Work, installer of ceiling system and representatives of trades involved are to have a conference at the job site, in the presence of the City of New York representative, to discuss coordination of ceiling system installation and resolve all discrepancies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Deliver all acoustical units in manufacturer's original, unopened packages fully identified with type, finish, performance data and compliance labeling.

B. Storage

1. Store materials where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.
2. Store tile containers in space where they will be installed for at least 24 hours prior to installation to stabilize moisture content and temperature.

C. Handling

1. Handle ceiling units carefully to avoid chipping edges or damaging units in any way.

1.8 PROJECT CONDITIONS

A. Space Enclosure

1. Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and dry, work above ceilings is completed, and until air temperature and humidity are maintained at values of final occupancy.
2. Pressurized plenums: Operate HVAC system for not less than 48 hours before beginning acoustical panel installation.

1.9 GUARANTEE

- A. Work showing defects in workmanship or materials within the one year guarantee period specified in the Contract shall be corrected as directed by the City of New York. Defects include but are not limited to:

1. Tiles or suspension system loose or improperly secured.
2. Tiles or suspension members showing discoloration or cracking.



3. Tiles or suspension members warping, sagging, or deforming.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS, MODELS**

#### **A. Acoustical Tile**

1. Mineral Composition Tile (12" x 12"), sag resistance to at least 104°F, 90% RH.
  - a. Armstrong World Industries
  - b. CertainTeed Corporation
  - c. USG Interiors Inc.
  - d. Or approved equal

#### **B. Acoustical Panels**

1. Mineral Composition Panels (24" x 48" x 3/4")
  - a. USG Interiors Inc.  
  
Product name: "Mars"  
  
Product number: 88785  
  
Environmental  
performance type: "ClimaPlus"
  - b. Armstrong World Industries  
  
Product name: "Ultima"  
  
Product number: 1914  
  
Environmental  
performance type: "HumiGuard Plus"
  - c. CertainTeed Corporation  
  
Product name: "Symphony-m"  
  
Product number: 1220BB-IOF-1

Environmental  
performance type: "104/90"

d. Or approved equal

C. Indirect Metal Suspension Systems (suspension members for panel ceilings shall be by the manufacturer of the ceiling panels or by a company recommended by the panel manufacturer).

1. Chicago Metallic Corporation
2. Donn Corporation / USG Interiors, Inc.
3. Armstrong World Industries, Inc.
4. Or Approved equal

## 2.2 MATERIALS - ACOUSTICAL TILES AND PANELS

### A. Mineral Fiber Tile and Panels

1. Provide units per ASTM E1264; of designation, style, finish, color, acoustical range, edge detail and size as indicated below:

a. Suspended (Exposed grid, lay-in) Installation

Style:	Fine Texture
Size:	24" x 48" x 3/4", or as indicated.
Edge Profile:	Reveal beveled tegular, or as indicated.
Weight:	0.95-1.05 lbs./sq.ft.
NRC:	Min. .70
CAC:	Min. .35
Light Reflectance	Min. .85 Average
Color:	White
Finish:	Factory finish

B. Provide fire-rated ceiling systems when indicated on the Drawings as part of a fire-rated assembly, with ratings as stipulated.

## 2.3 MATERIALS - METAL SUSPENSION SYSTEMS - INDIRECT HUNG

### A. Exposed Grid Suspension System

B. Manufacturer's standard system, with design and finish as selected by the Commissioner.

1. Structural Classification: Heavy-duty system in accordance with ASTM C 635.



2. Face width: 15/16".
3. Main runners: Connect to direct suspension system. Conform to ASTM C 635 for heavy-duty classification.
4. Provide runners suitable for attachment of hold-down clips and impact clips as applicable.
5. Hold-Down Clips for Non-Fire-Rated Ceilings: For ceilings composed of lay-in panels, provide hold-down clips spaced 2'-0" o.c. on all cross tees.
6. For metal panel ceilings the exposed grid shall be furnished by the panel manufacturer, or by a company recommended by the panel manufacturer, and finish shall match panels. Main runners and cross runners shall be G60 hot-dipped galvanized steel in accordance with ASTM A653, with aluminum capping.
7. Impact Clips: Provide in high impact areas, including corridors, lobbies, and gymnasiums, and at other locations indicated. Provide manufacturer's impact clip ("keep clip") system designed to absorb impact forces against lay-in panels. Provide number of clips recommended by manufacturer; not less than 4 clips per panel. System shall meet requirements of Article titled "Impaction Ceiling System Installation".

2.4 MISCELLANEOUS MATERIALS

A. Tile Adhesive

1. Comply with ASTM D1779 or FS-MMM-A-00150, factory made product recommended by manufacturer, bearing UL label for Class 0-25 flame spread.
2. All adhesives used on site shall comply with New York City V.O.C. requirements..

B. Primer

1. In accordance with manufacturer of acoustical tile adhesive, substrate shall be primed with one of the following products prior to application of adhesive to remove any residual which would prevent proper attachment of tile:
  - a. Chemical Wash
  - b. Sizing
  - c. Adhesive base or primer
  - d. All adhesive base and primers used on site shall comply with V.O.C. requirements specified in Section G01600.



- C. Edge Moldings and Trim Pieces
  - 1. Provide manufacturer's standard molding for edges and penetrations of ceiling units which fit with type of edge detail and suspension system indicated.
- D. Tile Fasteners
  - 1. Cadmium plated, type recommended by tile manufacturer, but for not less than 1/2" penetration of substrate.
- E. Drop Clips
  - 1. 18 gage galvanized steel with key hole slot, or other configuration approved by New York City Dept. of Buildings for connection of ceiling suspension members to carrying channels.
  - 2. Drop clips shall be of length required for indicated ceiling height, and to provide clearances for lighting fixtures, mechanical equipment, and other items above the ceiling. Where necessary because of limited clearance, provide clips that connect runners tight to the bottom of carrying channels.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine the building before beginning Work to determine that it is properly enclosed and the structure is in proper condition to receive acoustical materials and suspension system. Area shall be broom cleaned and uninterrupted for free movement of rolling scaffold. Do not proceed until satisfactory conditions prevail.
- B. Verify that direct suspension system has been installed properly, that main runners are spaced evenly and have been leveled to a tolerance of 1/8" in 12' measured both lengthwise on each runner and transversely between parallel runners so that indirect suspension system installation may proceed accurately.
- C. Start of Work constitutes acceptance of existing conditions, therefore, contractor is advised to bring any discrepancies to the attention of the City of New York prior to start of Work.

#### **3.2 PREPARATION**

- A. Coordination
  - 1. Provide and coordinate the locations of inserts, clips, or other supports for support of acoustical ceilings.
  - 2. Determine the length of drop clips required to maintain indicated ceiling height and to provide necessary clearance for electrical, mechanical and other



equipment. Where necessary for clearance, clips that connect runners tight to the bottom of carrying channels shall be used.

- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans.
- C. Adhesive Tile Installations
  - 1. Before installing adhesively-applied tile on wet-placed substrate such as cast in place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.
  - 2. Surface Preparation: Remove dirt, dust, oil, grease, and other foreign matter that may impair proper bonding of the tile adhesive. Clean and prepare substrate in accordance with the adhesive manufacturer's instructions and as specified.
    - a. Existing Painted Surfaces: Remove loose, peeling, and blistered coatings. Sand glossy surfaces to a dull finish.
    - b. Concrete Surfaces: Remove laitance, fins, and other defects that may impair bonding of the tile adhesive or may prevent alignment of tiles in a uniform plane.

### 3.3 INSTALLATION - GENERAL

- A. Install materials in accordance with manufacturer's printed instructions and in compliance with ASTM C636, NYC Building Code, fire resistance rating requirements, as indicated.
  - 1. Coordinate requirements for Work of other trades to be built into ceiling system. Provide supplementary framing as required.
- B. Arrange directionally-patterned units (if any) in manner shown by reflected ceiling plans, or as approved by the Commissioner. Install in patterns indicated, (balanced borders all sided) symmetrical or centered about center line of corridors, panels, fixtures, beam haunches, rooms, spaces.
- C. Cut as required for installation of electric fixtures, air diffusers, grilles, sprinkler heads, security devices, access doors, etc. Verify sizes and locations with other trades.
- D. On completion, the ceilings shall present a uniform horizontal plane surface, unless otherwise indicated, free from blemishes and imperfections. Exposed grid cross runners shall fit tightly against adjacent main runners, with no visible gaps.
- E. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
  - 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.



2. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
- F. Install panels in coordination with suspension system with suspension members concealed by support of tile units.
- G. Neatly scribe and cut panels to fit accurately at borders, interruptions, and penetrations. The cut edges of reveal tegular lay-in mineral fiber panels shall be field cut to match profile of factory edges, in accordance with manufacturer's printed instructions. Paint the cut edges to match factory finish where exposed to view, using paint supplied by panel manufacturer.

#### 3.4 DIRECT (ADHESIVE) TILE INSTALLATION

- A. Apply primer as specified herein to all concrete surfaces prior to cementing tiles in place.
- B. Remove loose dust from backs of tiles by brushing and then priming them with thin coat of adhesive.
- C. Cement acoustic tile directly to concrete ceiling slab, between beam haunches and to plaster or gypsum board ceiling with (4) spots of adhesive to each square foot of tile. Each spot of adhesive shall produce a surface of not less than (2) inches in diameter after tile has been pressed in place.
- D. Fit adjoining tiles to form neat and uniform hairline joints that are straight and parallel to the room axis in both directions. Install directionally patterned or textured tiles in a checkerboard pattern unless otherwise indicated.
- E. Scribe and cut tile to fit accurately at ceiling edges and penetrations. Install molding at ceiling perimeter, openings, cut-outs and where otherwise indicated.

#### 3.5 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.
- B. Remove and replace Work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- C. Remove and replace Work that is damaged or soiled by other trades as directed by the Commissioner.

END OF SECTION



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## **SECTION 09 65 13**

### **RESILIENT BASE**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

##### **1.2 SUMMARY**

- A. Section Includes:
1. Vinyl base.
  2. Vinyl molding accessory.

##### **1.3 ACTION SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
- C. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
- D. Samples for Initial Selection: For each type of product indicated.

##### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Coordinate mockups in this Section with mockups specified in other Sections.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless the Commissioner specifically approves such deviations in writing.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.



1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg or more than 90 deg F.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

**PART 2 - PRODUCTS**

2.1 VINYL BASE

- A. Manufacturers:
  - 1. Johnsonite/Tarkett
  - 2. Armstrong World Industries, Inc.
  - 3. Roppe Corporation
  - 4. Or approved equal.
- B. Product Standard: ASTM F 1861, Type TV (vinyl, thermoplastic).
  - 1. Group: I (solid, homogeneous).
  - 2. Style and Location:
    - a. Cove: Provide in areas with resilient floor coverings.
- C. Minimum Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Cut lengths 48 inches long.



- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors and Patterns: to be selected by Commissioner.

## 2.2 VINYL MOLDING ACCESSORY

- A. Manufacturers:
  - 1. Azrock/Tarkett
  - 2. Armstrong World Industries, Inc.
  - 3. Roppe Corporation
  - 4. Or approved equal.
- B. Description: Vinyl transition strips
- C. Profile and Dimensions: As indicated.
- D. Locations: Provide vinyl molding accessories in areas indicated.
- E. Colors and Patterns: to be selected by commissioner.

## 2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by manufacturer.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.



1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  1. Installation of resilient products indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
  1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
  1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.



- a. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
  - a. Miter corners to minimize open joints.

### 3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

### 3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
  1. Remove adhesive and other blemishes from surfaces.
  2. Sweep and vacuum horizontal surfaces thoroughly.
  3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from resilient stair treads before applying liquid floor polish.
  1. Apply two coats.
- E. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION



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**SECTION 09 65 19**

**RESILIENT TILE FLOORING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Section Includes:  
1. Vinyl composition floor tile.

**1.3 ACTION SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product.
- C. Shop Drawings: For each type of resilient floor tile.
1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  2. Show details of special patterns.
- D. Samples: Full-size units of each color, texture, and pattern of floor tile required.
- E. Samples for Initial Selection: For each type of floor tile indicated.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.

**1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.



1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
  - 1. Engage an installer who employs workers for this Project who are properly trained by floor tile manufacturer for installation techniques required.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
  - 1. Coordinate mockups in this Section with mockups specified in other Sections.
    - a. Size: Minimum 100 sq. ft. for each type, color, and pattern.
  - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless the Commissioner specifically approves such deviations in writing.
  - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.



**PART 2 - PRODUCTS**

**2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

**2.2 VINYL COMPOSITION FLOOR TILE**

- A. Manufacturers:
1. Armstrong World Industries, Inc. Lancaster, PA: "Standard Excelon Imperial Texture".
  2. Tarkett Inc. Houston Texas: "Azrock" by Tarkett-Standard VCT and "Expressions" by Tarkett.
  3. Mannington Mills, Inc.: "Essentials" and "Designed Essentials".
  4. Or approved equal.
- B. Tile Standard: ASTM F 1066.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch.
- E. Size: 12 by 12 inches.
- F. Colors and Patterns: to be selected by Commissioner.

**2.3 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
- C. Seamless-Installation Accessories:
1. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.



- D. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
  3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
    - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.



- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

### 3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - 1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.



3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
  - 1. Remove adhesive and other blemishes from surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
  - 1. Apply two coats.
- E. Cover floor tile until Substantial Completion.

END OF SECTION



## SECTION 09 91 13

### EXTERIOR PAINTING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

##### 1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
1. Concrete masonry units (CMUs)
  2. Steel and iron.
  3. Galvanized metal.
  4. Aluminum (not anodized or otherwise coated).
  5. Stainless steel.
  6. Bituminous-coated surfaces.

##### 1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

##### 1.4 ACTION SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.



- B. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  - 2. Indicate VOC content.
- C. Sustainable Design Submittals:
  - 1. For non-flat paint, product data showing maximum concentration of VOC of 150 g/L.
- D. Samples for Initial Selection: For each type of topcoat product.
- E. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches square.
  - 2. Apply coats on Samples in steps to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- F. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

#### 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. The commissioner will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
    - b. Other Items: The commissioner will designate items or areas required.
  - 2. Final approval of color selections will be based on mockups.
    - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by the Commissioner at no added cost to the City of New York.
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless the Commissioner specifically approves such deviations in writing.
  - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with specified requirements, provide "First Line" or "Top Quality" products of one of the following manufacturers:
1. Benjamin Moore and Co.
  2. The Sherwin Williams, Co.
  3. PPG Industries, Pittsburgh Paints Inc.
  4. Or approved equal
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to product listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAIN, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Non-flat paint shall have maximum VOC content of 150 g/L.



- D. Colors: As selected by The Commissioner.

### 2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: The Commissioner reserves the right to invoke the following procedure:
1. The Commissioner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  2. Testing agency will perform tests for compliance with product requirements.
  3. The Commissioner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
  2. Masonry (CMUs): 12 percent.
  3. Wood: 15 percent.
- C. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.



- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:
  - 1. SSPC-SP 2.
  - 2. SSPC-SP 3.
  - 3. SSPC-SP 7/NACE No. 4.
  - 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.
- J. Wood Substrates:
  - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
  - 2. Sand surfaces that will be exposed to view, and dust off.
  - 3. Prime edges, ends, faces, undersides, and backsides of wood.
  - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.



### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
  - 3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
  
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
  
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
  
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
  
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
  - 1. Paint the following work where exposed to view:
    - a. Equipment, including panelboards
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Tanks that do not have factory-applied final finishes.

### 3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: The Commissioner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations at no additional cost to the City of New York.



3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by the Commissioner, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System:

- a. Prime Coat: Primer, alkali resistant, water based.
- b. Prime Coat: Latex, exterior, matching topcoat.
- c. Intermediate Coat: Latex, exterior, matching topcoat.
- d. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5).

B. CMU Substrates:

1. Latex System MPI EXT 4.2A.

- a. Prime Coat: Block filler, latex, interior/exterior, MPI #4.
- b. Intermediate Coat: Latex, exterior, matching topcoat.
- c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

C. Steel and Iron Substrates:

1. Alkyd System MPI EXT 5.1D.

- a. Prime Coat: Primer, alkyd, anticorrosive, for metal MPI #79.
- b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
- c. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5), MPI #94.



D. Aluminum Substrates:

1. Alkyd System MPI EXT 5.4A.
  - a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
  - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
  - c. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5), MPI #94.

E. Stainless-Steel Substrates:

1. Alkyd System MPI EXT 5.6A.
  - a. Prime Coat: Vinyl wash primer, MPI #80.
  - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
  - c. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5), MPI #94.

F. Exterior Bituminous-Coated Substrates:

1. Latex Aggregate Coating System, MPI EXT 10.2B.
  - a. Prime Coat: As recommended in writing by topcoat manufacturer.
  - b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
  - c. Topcoat: Textured coating, latex, flat MPI #42.

END OF SECTION



## **SECTION 09 91 23**

### **INTERIOR PAINTING**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

##### **1.2 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
1. Concrete.
  2. Concrete masonry units (CMUs).
  3. Steel and iron.
  4. Galvanized metal.
  5. Aluminum (not anodized or otherwise coated).
  6. Stainless steel.
  7. Gypsum board.
  8. Acoustic panels and tiles.

##### **1.3 DEFINITIONS**

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.



- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product. Include preparation requirements and application instructions.
1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  2. Indicate VOC content.
- C. Sustainable Design Submittals:
1. For flat paint, product data showing maximum concentration of VOC of 100 g/L.
  2. For non-flat paint, product data showing maximum concentration of VOC of 150 g/L.
- D. Samples for Initial Selection: For each type of topcoat product.
- E. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches square.
  2. Apply coats on Samples in steps to show each coat required for system.
  3. Label each coat of each Sample.
  4. Label each Sample for location and application area.
- F. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. The Commissioner will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
    - b. Other Items: the Commissioner will designate items or areas required.
  2. Final approval of color selections will be based on mockups.



- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by the Commissioner at no added cost to the City of New York.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless the Commissioner specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with specified requirements, provide "First Line" or "Top Quality" products of one of the following manufacturers:
  1. Benjamin Moore and Co.
  2. The Sherwin Williams, Co.
  3. PPG Industries, Pittsburgh Paints Inc.
  4. Or approved equal
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.



2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Flat paint shall have maximum VOC content of 100 g/L. Non-flat paint shall have maximum VOC content of 150 g/L.
- D. Colors: As selected by the Commissioner

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: The Commissioner reserves the right to invoke the following procedure:
  - 1. The Commissioner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  - 2. Testing agency will perform tests for compliance with product requirements.
  - 3. The Commissioner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

**PART 3 - EXECUTION**

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.



2. Masonry (CMUs): 12 percent.
  3. Wood: 15 percent.
  4. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.
- E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- G. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
1. SSPC-SP 2.
  2. SSPC-SP 3.



3. SSPC-SP 7/NACE No. 4.
  4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- I. Aluminum Substrates: Remove loose surface oxidation.

### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
  2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in equipment rooms:
    - a. Equipment, including panelboards
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.



- d. Pipe hangers and supports.
  - e. Metal conduit.
  - f. Plastic conduit.
  - g. Tanks that do not have factory-applied final finishes.
  - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces:
- a. Equipment, including panelboards.
  - b. Uninsulated metal piping.
  - c. Uninsulated plastic piping.
  - d. Pipe hangers and supports.
  - e. Metal conduit.
  - f. Plastic conduit.
  - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
  - h. Other items as directed by the Commissioner.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

### 3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: The Commissioner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
  2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations at no additional cost to the City of New York.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by the Commissioner, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.



3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Institutional Low-Odor/VOC Latex System MPI INT 3.1M.
  - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
  - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
  - c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3, MPI #145).

B. CMU Substrates:

1. Institutional Low-Odor/VOC Latex System MPI INT 4.2E.
  - a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
  - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
  - c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.

C. Steel Substrates:

1. High-Performance Architectural Latex System MPI INT 5.1R.
  - a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
  - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
  - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.

D. Galvanized-Metal Substrates:

1. High-Performance Architectural Latex System MPI INT 5.3M.
  - a. Prime Coat: Primer, galvanized, water based, MPI #134.
  - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
  - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.

E. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. High-Performance Architectural Latex System MPI INT 5.4F.



- a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
  - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
  - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
- F. Stainless Steel Substrates:
1. High-Performance Architectural Latex System MPI INT 5.6G.
    - a. Prime Coat: Primer, bonding, solvent based, MPI #69.
    - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
    - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
- G. Gypsum Board Substrates:
1. Institutional Low-Odor/VOC Latex System MPI INT 9.2M.
    - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
    - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
    - c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5), MPI #147.
- H. Acoustic Panels and Tiles:
1. Institutional Low-Odor/VOC Latex System MPI INT 9.3D.
    - a. Prime Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
    - b. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1), MPI #143.

END OF SECTION



**Department of  
Design and  
Construction**

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**SECTION 09 96 56**  
**SLIP-RETARDANT EPOXY FLOOR COATING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This Section includes surface preparation and the application of slip-retardant epoxy floor coating on interior exposed concrete floors.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: Submit manufacturer's technical data, application instructions and general recommendations for slip-retardant epoxy floor coating specified herein.
- C. Samples for Initial Selection: For each type of topcoat product indicated.
- D. Samples
1. Submit two 1"x4" samples in color and profile as selected.
- E. Material certificates signed by manufacturer certifying that the slip-retardant epoxy coating floor coating complies with requirements specified herein.
- F. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Single-Source Responsibility: Obtain epoxy floor coating materials including primers, slip-retardant aggregates, resins, hardening agents and finish coats from a single manufacturer.



1.5 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. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with slip-retardant epoxy coating manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation and other conditions required to execute and protect work.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Dex-O-Tex, Rancho Dominguez, CA 90221
  - 2. Tnemec Inc., Kansas City, MO 64120
  - 3. Carboline, St Louis, MO 63146
  - 4. Or approved equal.

2.2 PROPERTIES

- A. Colors: As indicated, or if not otherwise indicated, as selected by Commissioner from manufacturer's standard colors.
- B. Physical Properties: Provide floor coating system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test methods in parentheses.
  - 1. Overall Thickness (Dry Film) to Top of Slip-Retardant Aggregate:



- a. Very Fine Profile 3 mils
- b. Fine Profile 18 mils
- c. Medium Profile 32 mils
- d. Coarse Profile 54 mils
- e. Very Coarse Profile 90 mils

2. Coefficient of Friction-Rubber Shoe Surface: (MIL-PRF-3134 Test Procedure):

a. Static Friction:

	<u>Saltwater Solution on Surface</u>	<u>Oil on Surface</u>
Fine Profile	0.95	0.75
Medium Profile	1.03	0.75
Coarse Profile	1.09	0.85
Very Coarse Profile	1.24	0.78

b. Sliding Friction:

	<u>Saltwater Solution on Surface</u>	<u>Oil on Surface</u>
Fine Profile	0.89	0.44
Medium Profile	0.95	0.45
Coarse Profile	1.00	0.56
Very Coarse Profile	1.04	0.59

c. Chemical Resistance:

ASTM D-1308	(Total Immersion - 7 days)
Citric Acid (70%)	No Effect
Hydrochloric Acid (46%)	No Effect
Sulfuric Acid (96%)	No Effect
Sodium Hydroxide (50%)	No Effect
Lactic Acid	No Effect
Methyl Ethyl Ketone	No Effect
Hydraulic Fluid	No Effect
Butyl Acetate	No Effect

d. Resistance to Immersion:

MIL-PRF-23003A Para. 4.6.11	No softening, loss of adhesion or other form of deterioration
SAE 10 Oil	
Detergent Solution	

Fire Resistance:

Flame Spread Index - 0

ASTM E162

Smoke Deposited - 2mg



**PART 3 - EXECUTION**

**3.1 INSPECTION**

- A. Examine the areas and conditions where slip-retardant epoxy floor coating is 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 have been corrected by the Contractor in the manner acceptable to the Commissioner.

**3.2 PREPARATION**

- 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 bond-inhibiting curing compounds or form release agents. Remove grease, oil, and other penetrating contaminate. Restore damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance, and efflorescence.
- C. Materials: Mix epoxy primer and urethane coating components when required and prepare materials according to manufacturer's instructions.

**3.3 APPLICATION**

- A. General: Apply each component of slip-retardant epoxy coating system according to manufacturer's directions and to produce a uniform monolithic flooring surface.
- B. Bond Coat: Apply epoxy bond coat over prepared substrate at manufacturer's recommended spreading rate by roller, squeegee, trowel or spray.
- C. Basecoat: Trowel, roller, or squeegee apply two or three coats of slip-retardant epoxy coating as required with appropriate skid resistant profile.

**3.4 CURING, PROTECTING AND CLEANING**

- A. Cure epoxy floor 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.

END OF SECTION



## **SECTION 10 73 00**

### **PROTECTIVE COVERS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

##### **1.2 SECTION INCLUDES**

- A. Pre-engineered, pre-finished extruded aluminum canopies.

##### **1.3 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 2605 – High performance Specification for Exterior Coated Aluminum Extrusions and Panels.

##### **1.4 DESIGN REQUIREMENTS**

- A. Columns, Beams, Deck, and Trim: Aluminum extrusions.
- B. Structural Framing: Interlocking deck sections secured by screws.
  - 1. Heli-arc welded, one-piece rigid bents.
  - 2. Mechanically fastened bents using internally concealed bolted connections.
- C. Canopy: Self-draining from deck through bents to discharge point at ground level or as otherwise shown.
- D. Building Code: New York City Building Code
- E. Design Loads:
  - 1. Comply with Building Code for site location.
  - 2. Collateral Loads: Additional loads imposed by other materials or systems identified in contract documents.



- F. Structural Design: Prepare complete structural design calculations for canopy members.

#### 1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures"
- B. Product Data: Manufacturer's catalog data, detail sheets, and specifications.
- C. Shop Drawings: Layout and erection drawings showing roof framing, deck panels, cross sections, and trim details, clearly indicating proper assembly.
- D. Samples: Color selection samples consisting of actual coating material or anodizing process on aluminum extrusions.
- E. Quality Assurance/Control Submittals:
1. Qualifications: Letter certifying manufacturer's required qualifications.
  2. Structural Design Calculations.
  3. Manufacturer's Installation Instructions.

#### 1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Overall Standard: Structural engineering design documents stamped by a professional structural engineer licensed in the state of New York
- C. Manufacturer Qualifications: Minimum three years experience in producing covers/canopies with welded bents and of the type specified.
- D. Installer Qualifications: Minimum two years experience in erecting covers/canopies of the type specified.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Follow manufacturer's instructions.

### **PART 2 PRODUCTS**

#### 2.1 MANUFACTURERS

- A. Manufacturer:



1. Perfection Architectural Systems, Inc., 2310 Mercator Drive Orlando, FL 32807; Tel: (800) 238-7207, Fax: (407) 671-8252.
2. Tennessee Valley Metals, Inc., 190 Industrial Park Road, Oneonta, AL 35121; Tel: (205) 274-9500, Fax: (205) 274-9501
3. Peachtree Protective Covers, 3255 S. Sweetwater Road, Lithia Springs, GA 30122; Tel: (800) 341-3325
4. Or approved equal

B. Provide all protective covers from a single manufacturer.

## 2.2 MATERIALS

A. Aluminum Extrusions: 6063 alloy, T-6 temper.

## 2.3 COMPONENTS

A. Columns:

1. Size: As shown on structural drawings.

B. Beams: Open top aluminum tubular extrusions.

1. Size: As shown on structural drawings.

C. Deck: Rigid-Roll-Lock extruded aluminum, self-flashing, interlocking sections.

1. Size and Profile: As shown on drawings.

D. Fascia: Manufacturer's standard extruded aluminum fascia sections as shown on drawings and as required to complete the installation resulting in a neat finished appearance.

1. Include manufacturer's standard extruded aluminum gutters.

E. Flashing: Aluminum sheet, thickness as recommended by manufacturer for specific condition.

## 2.4 ACCESSORIES

A. Fasteners:

1. Deck Screws: No. 14 by 1 inch (25 mm), self-tapping, Type 18-8 stainless steel with neoprene washers.
2. Trim Screws: No. 10 by 1/2 inch (13 mm), self-tapping, Type 18-8 stainless steel.
3. Trim Rivets: Aluminum, size recommended by manufacturer for specific condition.
4. Other Fasteners: Type 18-8 stainless steel, type recommended by manufacturer for specific condition.



## 2.5 FABRICATION

- A. Shop Assembly: Fabricate cross beams and columns into one-piece rigid bents with corners mitered and heli-arc welded to the extent that completed bents can be shipped on local, state, and federal highways without special permit. Provide bolted connections for bents required to be shipped unassembled.
- B. Shop Assembly: Fabricate cross beams and columns for field assembled bolted connections.

## 2.6 FINISHES

- A. Bents:
  - 1. Two-Coat PVDF, Fluoropolymer finish, comply with AAMA 2605.
    - a. Color: As selected by the Commissioner from manufacturer's standard color range to match color of parapet coping.
- B. Deck:
  - 1. Two-Coat PVDF, Fluoropolymer finish, comply with AAMA 2605.
    - a. Color: As selected by the Commissioner from manufacturer's standard color range to match color of parapet coping.
- C. Fascia/Gutter:
  - 1. Two-Coat PVDF, Fluoropolymer finish, comply with AAMA 2605.
    - a. Color: As selected by the Commissioner from manufacturer's standard color range to match color of parapet coping.

## **PART 3 EXECUTION**

### 3.1 EXAMINATION

- A. Examine building surfaces to which canopy will connect.
- B. Coordinate with responsible trade to perform corrective work on unsatisfactory footings or surfaces.
- C. Commencement of work by installer is acceptance of existing conditions.

### 3.2 ERECTION

- A. Erect protective covers in accordance with manufacturer's installation instructions.



- B. Set bents plumb, straight, and true to line, adequately braced to maintain position until grout has cured.
- C. Keep aluminum surfaces from direct contact with ferrous metal or other incompatible materials by applying one coat of clear acrylic coating.

3.3 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.4 PROTECTION

- A. Protect finished aluminum surfaces from damage due to subsequent construction operations.

END OF SECTION



**Department of  
Design and  
Construction**

FMS No. S136-383S  
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*District SI-3 Garage and Repair Shop  
HVAC System and Roof Replacement*

Protective Covers  
10 73 00 - 6



**SECTION 21 05 17  
SLEEVES AND SEALS FOR FIRE SUPPRESSION PIPING**

**PART 1 - - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide a U.L. approved firestopping system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Firestop Compounds.
- B. Damming Material.
- C. Sleeves

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit shop drawings, product data, and manufacturer's installation instructions for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site. Literature shall indicate product characteristics, typical use, performance and limitation criteria and test data.
- C. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details shall accurately reflect actual job conditions.
- D. Submit Material Safety Data Sheets with product delivered to job site.
- E. U.L. Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which firestop materials will be used and thickness for different hourly ratings, and approved UL system number.



- F. Submit manufacturer's installation procedures for each type of product.
- G. Upon completion, installer shall provide written certification that materials were installed in accordance with the manufacturer's installation instruction and details.

## **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Firestop system installation shall conform to requirements of qualified designs or manufacturer approved modifications, as supported by engineering reports. Field inspections shall be carried out by the firestop manufacturer to verify that the installation is in accordance with the manufacturer requirements.
- C. Install firestop materials and systems as per the approved UL (Underwriters Laboratories) installation procedure.
- D. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials (firestop system) meets the requirements specified in accordance with the applicable referenced standards.
- E. The firestop compound shall not contain any solvents or inorganic fibers. The penetration seal material must be unaffected by moisture and must maintain the integrity of the floor or wall assembly for its rated time period when tested in accordance with ASTM E814 (UL1479). The system shall be U.L. Classified for up to and including 3 hours.
- F. Firestopping materials shall be asbestos and lead free and shall not incorporate or not require the use of hazardous solvents.
- G. Firestopping sealants must be flexible, allowing for normal pipe movement.
- H. All fire stopping materials shall be manufactured by one manufacturer.
- I. Installation of firestopping systems shall be performed by a Contractor properly trained or approved by the firestop manufacturer.
- J. Material used shall be in accordance with the manufacturer's written installation instructions.
- K. Submit a line-by-line statement of compliance or non-compliance with this specification section.

## **PART 2 - PRODUCTS**

### **2.1 FIRESTOPPING**

- A. Provide firestop compounds for caulk, pour, trowel or pump application. Material must be capable of sealing openings around single or multiple pipes against fire, smoke and toxic gases, and maintaining rating with a thickness no greater than the structure.



- B. Provide a damming material, where required, per manufacturer's recommendations and as shown on the Drawings.
- C. Provide a firestop system consisting of a material, or combination of materials, to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke or gases through penetrations in fire-rated barriers. It shall be used in specific locations as follows:
  - 1. Penetrations for the passage of piping through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
  - 2. Locations shown specifically on the drawings or where specified in other sections of these specifications.
- D. **MATERIALS**
  - 1. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating item(s) without affecting the adhesion or integrity of the system.
  - 2. Firestopping materials shall not require hazardous waste disposal of used containers/packages.
  - 3. Provide firestopping materials free of solvents which will not experience shrinkage while curing.
  - 4. Firestopping materials shall be unaffected by moisture.

**2.2 SLEEVES**

- A. Provide sleeves for each pipe passing through walls, partitions, and floors.
- B. Wall and floor sleeves.
  - 1. Sleeve Materials

Type	Sleeve Materials
1	#18 gauge, galvanized steel
2	Standard weight galvanized steel pipe

- 2. Sleeve Sizes
  - a. Sleeves shall be of adequate diameter to allow pipe, insulation, and fire stopping to fit.
  - b. Sleeves shall provide 1" minimum clearance around pipes smaller than 4" and 2" minimum clearance around pipes 4" and larger.



3. Sleeve Lengths

Location	Sleeve Length	Material
Floor	All floor sleeves to extend minimum of 2" above finished floor level.	2
Stair Landing	Equal to depth of construction and terminated flush with finished surfaces.	2
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces.	1
Floors with membrane waterproofing	All floor sleeves to extend minimum of 2" above finished floor level.	3

C. Foundation Wall Sleeves

1. Seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve opening; refer to approved manufacturers within specification below. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely watertight seal between the pipe and wall opening. The seal shall be constructed so as to provide electrical insulation between the pipe and wall, thus reducing changes of cathodic reaction between these two members.
2. Contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabricating or installing. The inside diameter of each wall opening shall be sized as recommended by the manufacturer to fit the pipe to assure a watertight joint. If pipe O.D. is non-standard due to coating, insulation, etc., consult manufacturer for assistance before proceeding with wall opening detail

**2.3 MANUFACTURERS**

A. Firestopping

1. Specified Technologies, Inc.
2. Dow Corning
3. 3M



4. International Protective Coatings
  5. Hilit Fs-One Max
  6. Approved equal
- B. Foundation Wall Sleeves
1. Calpico "Pipe Linx"
  2. Linkseal
  3. Metraflex
  4. Hilti
  5. Approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.
- 3.2 Deliver materials to site in original unopened containers or packages bearing the manufacturer's name, brand designation, product description and U.L. Classification Mark.
- 3.3 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job site.
- 3.4 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- 3.5 Comply with recommended procedures, precautions or remedies described in Material Safety Data Sheets as applicable.

#### **3.6 EXAMINATION**

- A. Examine areas and conditions under which work is to be performed and notify the Commissioner in writing of conditions detrimental to proper and timely completion of the work.
- B. Verify that openings are properly sized and in suitable condition to receive the work of this section.
- C. Verify manufacturer's printed instructions for installation and when applicable, curing in accordance with temperature and humidity. Conform to ventilation and safety requirements.
- D. Verify the condition of the substrates before starting work.



- E. Verify Weather Conditions. Do not proceed with installation of firestop materials when temperatures fall outside the manufacturer's suggested limits.
- F. Verify that firestopping materials are installed so as not to contaminate adjacent surfaces.
- G. Schedule firestopping after installation of penetrants but prior to concealing the openings.
- H. Where firestopping is installed at locations which will remain exposed in the completed work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.
- I. Verify that all pipe, conduit, ducting which penetrate fire-rated construction have been permanently installed prior to installation of firestop.

### **3.7 PREPARATION**

- A. Clean substrate of dirt, dust, grease, oil, loose materials, rust or other matter that may affect the proper fitting or adhesion of the firestopping materials.
- B. Clean metal and glass surfaces with a non-alcohol solvent.

### **3.8 INSTALLATION**

- A. Installation of firestops shall be performed by an applicator/installer qualified and properly trained by the manufacturer. Installation shall be performed in strict accordance with manufacturer's details installation procedures.
- B. Apply firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, and manufacturer's recommendations.
- C. Unless specified and approved, all insulation used in conjunction with through-penetrations shall remain intact and undamaged and may not be removed.
- D. Seal holes and penetrations to ensure an effective smoke seal.
- E. In areas of high traffic, protect firestopping materials from damage.
- F. Insulation types specified in other sections shall not be installed in lieu of firestopping material specified herein.
- G. All combustible penetrants (e.g. non-metallic pipes or insulated metallic pipes) shall be firestopped using products and systems tested in a configuration representative of the field condition.
- H. Dam Construction
  - 1. When required to properly contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming material must be removed after appropriate curing. Noncombustible damming materials may be left as a permanent component of the firestop system.



- 3.9** Firestopping may be required by other Subcontractors under related sections of the project specifications. Identify all locations requiring firestopping and coordinate the work of this section with work performed under other sections of the project to provide a uniform system of firestopping.
- 3.10** Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- 3.11** Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation.
- 3.12** Firestop systems do not re-establish the structural integrity of load bearing partitions.
- 3.13 UN-INSULATED COLD PIPES**
- A. Install a pipe sleeve through the wall or slab to be penetrated with an inside diameter large enough to include the pipe and firestopping.
  - B. Install firestop material at each end of sleeve to form a U.L. approved system.
  - C. Mark penetration in an approved manner to verify manufacturer's inspection.
  - D. Cover firestopping with escutcheon cover.
- 3.14 INSULATED PIPES**
- A. Install a pipe sleeve through the wall or slab to be penetrated with an inside diameter large enough to include the specified thickness of insulation.
  - B. Pipe insulation should be continuous through sleeve. Insulation should be covered with a vapor barrier. For depth of wall plus 1" on either side of wall or slab, vapor barrier shall be wrapped with a 26 gauge sheetmetal inner sleeve. Firestop shall be applied between wall sleeve and pipe protection sleeve.
  - C. Install firestop material at each end of sleeve to form a U.L. approved system.
  - D. Mark penetration in an approved manner to verify manufacturer's inspection.
  - E. Cover firestopping with escutcheon cover.
- 3.15 FIELD QUALITY CONTROL**
- A. Prepare and install firestopping systems in accordance with manufacturer's printed instruction and recommendations.
  - B. Follow safety procedures recommended in the Material Safety Data Sheets.
  - C. Finish surfaces of firestopping which are to remain exposed in the completed work to a uniform and level condition.



- D. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification.

**3.16 CLEANING**

- A. Remove spilled and excess materials adjacent to firestopping without damaging adjacent surface.
- B. Leave finished work in neat, clean condition with no evidence of spill overs or damage to adjacent surfaces.

**END OF SECTION 21 05 17**



**SECTION 21 05 18  
ESCUTCHEONS FOR SUPPRESSION PIPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide fire protection systems in accordance with the Contract Documents.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

**1.4 WORK INCLUDED**

- A. Escutcheons.

**1.5 SUBMITTALS**

- A. Product Data: Manufacturers' catalogs, brochures.

**1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
  - 1. Current Edition of New York City Building Code (2014)
  - 2. NYC FDNY
  - 3. National Fire Protection Association (NFPA)
  - 4. Underwriters Laboratories (U.L.)



**PART 2 - PRODUCTS**

**2.1 GENERAL**

- A. The following specifications represent desired design, materials and construction standards for the various items of work. Manufacturer names and model numbers are used to describe specific types, styles and quality.

**2.2 ESCUTCHEONS**

- A. Provide escutcheons on all exposed piping through walls, floors, partitions and ceilings
- B. Escutcheons shall be held in place by set screws.
- C. Escutcheon Application

<b>Location</b>	
All Spaces	Cast iron

- D. Two-piece or hinged escutcheons will not be permitted.
- E. Escutcheons shall be installed on both sides of pipe penetrations.

**2.3 MANUFACTURERS**

- A. Escutcheons
  - 1. PROFLO
  - 2. Keeney Mfg. Company
  - 3. Sioux Chief
  - 4. Approved equal

**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**END OF SECTION 21 05 18**



**SECTION 21 05 20  
PIPING AND FITTING MATERIALS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide piping and fitting materials for fire protection systems in accordance with the Contract Documents.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 WORK INCLUDED**

- A. Black Steel Pipes.
  - 1. Pipe
  - 2. Fittings
  - 3. Joints
  - 4. Application
- B. Galvanized Steel Pipes.
  - 1. Pipe
  - 2. Fittings
  - 3. Joints

4. Application

**1.5 SUBMITTALS**

- A. Prior to purchase, submit a list of all proposed piping materials for engineering review.

**1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Each pipe length shall have the manufacturer's name cast, stamped or rolled on.
- C. Each fitting shall have the manufacturer's name cast, stamped or rolled on.
- D. All Fire Protection components (including couplings, fittings, valves and accessories) to be supplied by one manufacturer and shall be UL listed and/or FM Global approved. Grooving tools shall be of the manufacturer as the grooved components.

**PART 2 - PRODUCTS**

**2.1 BLACK STEEL PIPE**

- A. Pipe: Standard weight black steel pipe, Schedule 40, welded or seamless, with manufacturer's name rolled into each length. Standard weight galvanized steel pipe, Schedule 40, with maker's name rolled into each length. Carbon Steel, A-53B/A-106B - Roll or cut grooved-ends as appropriate to pipe material, wall thickness, pressures, size and method of joining. Pipe ends to be grooved in accordance with the current listed standards conforming to ANSI/AWWA C-606
- B. Fittings
1. Threaded: Standard malleable iron couplings with flat band.
  2. Welded or Flanged: Standard weight steel.
  3. Mechanical Couplings: See Section 2.3.
- C. Joints: Red or white lead and oil or approved compound.
- D. Application
1. Threaded: Wet sprinkler systems.
  2. Welded: All fire standpipe over 175 psi.
  3. Mechanical Couplings: Sprinkler and Fire Standpipe (See Section 2.3).

**2.2 GALVANIZED STEEL PIPE**

- A. Pipe: Standard weight galvanized (GL) steel pipe, ASTM A795, Type E, Grade A for fire sprinkler applications up to 300 psi working pressure
- B. Fittings
  - 1. Threaded: Galvanized malleable iron with flat band steam pattern.
  - 2. Mechanical Couplings: See Section 2.3.
- C. Joints: Red or white lead and oil or approved compound.
- D. Application: Dry pipe sprinkler system.

**2.3 MECHANICAL COUPLINGS**

- A. Manufactured in two segments of cast ductile iron, conforming to ASTM A-536, Grade 65-45-12. Gaskets shall be pressure-responsive synthetic rubber, grade to suit the intended service, conforming to ASTM D-2000. Mechanical Coupling bolts shall be zinc plated (ASTM B-633) heat treated carbon steel track head conforming to ASTM A-449 and A-183, minimum tensile strength 110,000 psi (758450 kPa)
  - 1. Mechanical Coupling Gaskets: Pressure-responsive, synthetic rubber listed for use with the housings.

Fire Protection Service	Temperature Range	Gasket Recommendation
Dry Systems	Ambient	Grade EPDM, Type A
Water/Wet Systems	Ambient	Grade EPDM, Type A

- B. Flange Adapters: For use with grooved end pipe and fittings, for mating to ANSI Class 125 / 150 flanges.
- C. Grooved End Fittings: Fittings shall be cast of ductile iron conforming to ASTM A-536, Grade 65-45-12, forged steel conforming to ASTM A-234, Grade WPB 0.375" wall (9,53 mm wall), or fabricated from Std. Wt. Carbon Steel pipe conforming to ASTM A-53, Type F, E or S, Grade B. Fittings provided with an alkylid enamel finish or hot dip galvanized to ASTM A-153. Zinc electroplated fittings and couplings conform to ASTM B633.
- D. Hole-Cut Branch Outlets:
  - 1. Bolted Branch Outlet:
    - a. Branch reductions on 2"(DN50) through 8"(DN200) header piping. Bolted branch outlets shall be manufactured from ductile iron conforming to ASTM A-536, Grade 65-45-12, with synthetic rubber gasket, and heat-treated carbon steel zinc plated bolts and nuts conforming to physical properties of ASTM A-183.



- b. Header connections for sprinklers, drop nipples, sprigs, gauges, and drains on 1-1/4" through 2-1/2" header piping. Outlets shall be manufactured from ductile iron conforming to ASTM A-536, Grade 65-45-12, with synthetic rubber gasket, and heat treated carbon steel zinc plated bolts and nuts conforming to physical properties of ASTM A-183.

**2.4 MANUFACTURERS**

**A. Mechanical Couplings and Fittings**

1. Victaulic (selected herein as the basis of design)

a. Standpipe

Style	Pipe Weight	Pressure Rating	Sizes
77-Flexible	Schedule 40	0-500 PSI	1"-10"
Firelock - Rigid	Schedule 40	0-175 PSI	2"-6"

b. Sprinkler

Style	Pipe Weight	Pressure Rating	Sizes
77-Flexible	Schedule 40	0-500 PSI	1"-10"
Firelock - Rigid	Schedule 40	0-175 PSI	2"-6"
920	Schedule 40	0-175 PSI	2"-3"
921	Schedule 40	0-175 PSI	3"-8"

- 2. Grinnell
- 3. Shurjoint
- 4. Approved Equal

**B. Piping**

- 1. Allied Tube and Conduit Corp.
- 2. Berger Pipe Co.
- 3. Wheatland Tube Co.
- 4. Approved Equal



- C. Fittings
  - 1. Flagg
  - 2. Nibco
  - 3. Stockham
  - 4. Victaulic
  - 5. Approved Equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements

#### **3.2 JOINTS**

- A. Threaded Joints: Do not damage fitting surface, remove burrs and ream smooth. Apply red lead and oil to male threads only. Clean joint thoroughly of excess jointing material.
- B. Flanged Joints: Use matched flange faces and 1/16" thick compressed gaskets.
- C. Welded Joints:
  - 1. Butt welded joints shall be open type by the oxyacetylene torch or electric arc process. Fuse welds thoroughly to the joint edges and extend completely to the bottom of V-groove cut. Weld width to a minimum of 2½ times the pipe wall thickness and to be symmetrical with respect to the center line of joint. Build up welds to obtain a gradual increase in thickness from edge to center and the thickness from edge to center is not to exceed 1¼ times the pipe wall thickness. Make all welds of sound metal, free from laps, gas pockets, slag inclusions, interior protrusions or other imperfections.
  - 2. Welding Pressure Piping shall conform with the requirements of ANSI B31.1 with certification by the Welding Bureau of Heating, Piping and Air Conditioning Contractors National Association. Welding shall not be started until submission of evidence of qualification.
- D. Mechanical (Grooved) Joints: Joints shall be made with neoprene or synthetic rubber gaskets.
- E. Make joints between different piping materials with adaptor fittings of a type suitable for the purpose intended.
- F. Make joints between pipes of dissimilar metals with dielectric union or flanges.



### **3.3 PIPE AND FITTINGS**

- A. Threads shall be full and clean cut and burrs formed in cutting shall be reamed. In screwing up the pipe, care shall be taken that the pipe does not extend into the fitting obstructing the waterway. Joint compound shall be applied to the threads of the pipe and not to the fittings or sprinklers. Pipe shall be straightened before installation to prevent pockets.
- B. A one-piece reducing fitting shall be used wherever a change is made in the size. The use of bushings or reducing flanges will not be permitted.
- C. Unions shall be used only on pipes 2" and smaller, and provided at connections to each piece of equipment for easy dismantling.
- D. Only shoulder nipples shall be used. Close nipples will not be acceptable.
- E. All fittings and couplings shall be made by the same manufacturer.

**END OF SECTION 21 05 20**



**SECTION 21 05 23  
FIRE SUPPRESSION VALVES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide valves for fire protection systems in accordance with the Contract Documents.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 WORK INCLUDED**

- A. Grooved End Valve
  - 1. Gate Valve
  - 2. Ball Valve
  - 3. Check Valve

**1.5 SUBMITTALS**

- A. Manufacturers' Specifications and Engineering Data
  - 1. Each type valve.
  - 2. Materials or all parts.



3. Pressure ratings.
4. Schedule of major control valves, check valves and pressure reducing valves.
5. Certificates: Manufacturers' certification that valves and accessories meet or exceed specification requirements.

## **1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Each valve shall have the manufacturer's name, size and pressure rating cast or stamped on body.
- C. Each valve shall bear U.L./FM Global label or marking.
- D. Except as noted, type and size of materials and equipment as approved by:
  1. New York City Building Code
  2. Underwriter's Laboratory.
  3. National Fire Protection Association (NFPA).

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. All fire protection water control valves within the building shall be either wedge gate valves with painted iron wheel handles, shall have gland followers in stuffing boxes, and shall be constructed so that they may be repacked while open and under pressure, or slow-closing quarter-turn gear-operated butterfly valves.
- B. All valves shall have the name of the manufacturer and working pressure cast or stamped on body.
- C. All valves are to be U.L. listed and FM Global approved.
- D. All valves shall be with threaded, grooved, or flanged ends as required by the piping system in which they are installed.
- E. Valves shall be selected for the maximum working pressure they will be exposed to (including churn pressure), or as indicated on the drawings.
- F. All fire protection valves shall be provided with tamper switches.



## 2.2 GROOVED END VALVE

### A. Gate Valve: UL/FM Global approved, OS&Y Type

1. 2-1/2"(DN65) through 12"(DN300) Sizes OS&Y Gate Valves: 250 psi (1725 kPa), grooved ends. Ductile iron body conforming to ASTM A-536, cast iron yoke and handwheel conforming to ASTM A-126-B; EPDM coated ASTM A-126-B cast iron disc; ASTM B16 brass rising stem; flanged and epoxy coated cast iron bonnet; EPDM o-ring stem seals and body gasket.
2. 2-1/2"(DN65) through 12"(DN300) Sizes NRS Gate Valves: 250 psi (1375 kPa), grooved ends. Ductile iron body conforming to ATSM A-536, bronze mounted; EPDM coated ASTM A-126-B cast iron disc; ASTM B-16 brass non-rising stem; flanged and epoxy coated cast iron bonnet; EPDM o-ring stem steals and body gasket.
3. Wall Type Indicator Post: ASTM A-126-B cast iron wall type indicator post, with ASTM B-62 bronze operating stem and carbon steel operating rod.
4. Adjustable Indicator Post Vertical Type: ASTM A-126-B cast iron adjustable indicator post vertical type with ASTM A-126-B cast iron extension sleeve, ASTM B-62 bronze operating stem and carbon steel extension rod.
5. Ball Valve: UL/FM Global approved, 350 psi (2410 kPa), grooved or threaded ends, bronze body (ASTM B-584 Alloy 844), standard port, chrome-plated brass ball, stainless steel stem, TFE seats, brass gearbox, with pre-wired supervisory switches.
6. Check Valves: UL/FM Global approved.
  - a. 2"(DN50) through 3"(DN75) Sizes Spring Assisted: Black enamel coated ductile iron body, ASTM A-536, Grade 65-45-12, non-slam tilting disc, stainless steel disc and spring, brass shaft, 365 psi (2517 kPa). V
  - b. 4"(DN100) through 12"(DN300) Sizes Spring Assisted: Black enamel coated ductile iron body, ASTM A-536, Grade 65-45-12, elastomer encapsulated ductile iron disc suitable for intended service, stainless steel spring and shaft, welded-in nickel seat, 250 psi (1725 kPa).

## 2.3 MANUFACTURERS

### A. Valves

1. Victaulic (Basis of Design)
  - a. Ball Valve: Victaulic Series 728
  - b. Gate Valve: Victaulic Series 771
  - c. Check Valve: Victaulic Series 77H



2. Grinnell
3. Shurjoint
4. Nibco
5. Milwaukee
6. Approved equal.

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements

#### **3.2 INSTALLATION**

- A. All valves shall be installed only in the upright vertical or horizontal positions unless specifically otherwise required by the drawings.
- B. All valves shall be installed in accessible locations to facilitate easy removal for repair or replacement.
- C. All grooved end valves shall be of the same manufacturer as the grooved couplings and fittings.

**END OF SECTION 21 05 23**



**SECTION 21 05 29  
HANGERS, SUPPORTS, ANCHORS AND GUIDES FOR  
FIRE SUPPRESSION SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Work of this Section shall conform to the requirements of the Contract Documents.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 WORK INCLUDED**

- A. Hangers
- B. General Support and anchorage
- C. Pipe Attachments
- D. Concrete Post Installed Anchors

**1.5 SUBMITTALS**

- A. Manufacturer's literature, catalog data and illustrations.
- B. Shop Drawings indicating:
  - 1. Dimensions



2. Construction details of hangers, inserts, anchors and guides
3. Materials
4. Maximum Load
5. Locations
6. Recommended installation procedures

#### **1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Codes and Authorities
  1. ASA Code for Pressure Piping
  2. ASTM A-575-73
  3. MSS SP-58-67
  4. MSS SP-69-66
  5. Underwriters Laboratories
  6. National Fire Protection Association

### **PART 2 - PRODUCTS**

#### **2.1 HANGERS**

- A. All bracket, clamp and rod sizes indicated in this specification are minimum sizes only. All structural hanging materials shall have a built-in safety factor of 5.
- B. Provide rolled-steel auxiliary pipe supports as required.
- C. Anchor points shall be located and constructed to permit the piping system to take up its expansion and contraction freely in opposite directions from the anchored points.
- D. Guide points shall be located and constructed wherever required or shown on drawings and at each side of an expansion joint or loop, to permit free axial movement only in a piping system.
- E. All hangers shall be U.L. listed and FM approved.
- F. C-clamps with locknut and retaining clip will be permitted.



## **2.2 GENERAL SUPPORT AND ANCHORAGE**

- A. Provide pipe and equipment hangers and supports in accordance with the following:
1. When supports and anchorages for tanks, equipment, conduit, and piping are not shown on the drawings, the Contractor shall be responsible for their design.
  2. Supports and anchorages shall not introduce stresses in the piping caused by thermal expansion or contraction.
  3. Connections to structural framing shall not introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.
- B. Fabricate support members from welded standard structural shapes, pipe, and plate. Carry the necessary rollers, hangers, and accessories as required. Piping less than 4-inch pipe size may be supported from or by prefabricated roll-formed channels as specified in this section with necessary accessories to adequately support piping system.
- C. Supports and Accessories: Provide Preformed roll-formed channels and accessories with matching compatible accessories as required to accommodate the installation of piping.
- D. Acceptable Manufacturers:
1. B-Line Systems
  2. Grinnell
  3. Powerstrut
  4. Superstrut
  5. Unistrut
  6. Approved Equal

## **2.3 PIPE ATTACHMENTS**

- A. Insulated Horizontal Steel Piping: Grinnell Fig. 300. Fig. 260 with Fig. 167 shield, or comparable figure from the following Manufacturers:
1. B-Line Systems
  2. Superstrut
  3. Telco
  4. Approved equal.



5. Uninsulated Horizontal Steel Piping: Grinnell Fig. 260 or comparable figure from the following Manufacturers:

- a. B-Line Systems
- a. Superstrut
- b. Telco
- c. Approved equal.

B. Riser Clamps, Steel Pipe: Grinnell Fig. 261 or comparable figure from the following Manufacturers:

- 1. B-Line Systems
- 2. Superstrut
- 3. Telco
- 4. Approved equal.

C. Beam Hangers: Beam Clamps: Grinnell Fig. 228 or comparable figure from the following Manufacturers:

- 1. B-Line Systems
- 2. Superstrut
- 3. Telco
- 4. Approved equal.

D. Hanger Rod Schedule, Carbon Steel Rod, electro galvanized finish:

Pipe Size	Rod Diameter
4" and smaller	3/8"
5", 6", & 8"	5/8"
10" & above	3/4"

- 1. Manufacturers:
  - a. B-Line Systems
  - b. Grinnell (basis of design)
  - c. Superstrut



- d. Telco
- e. PHD
- f. Approved equal.

## **2.4 CONCRETE POST INSTALLED ANCHORS**

### **A. Installer Qualifications:**

1. Drilled-in anchors shall be installed by an Installer with at least five years of experience performing similar installations.
2. Installer Training: Conduct a thorough training with the manufacturer or the manufacturer's representative for the installer on the project. Training to consist of a review of the complete installation process for drilled-in anchors, to include but not limited to:
  - a. hole drilling procedure
  - b. hole preparation & cleaning technique
  - c. adhesive injection technique & dispenser training / maintenance
  - d. rebar dowel preparation and installation
  - e. proof loading/torquing

### **B. Certifications: Unless otherwise authorized by the Engineer, anchors shall have one of the following certifications:**

1. ICC ES Evaluation Report indicating conformance with current applicable ICC ES Acceptance Criteria.

### **C. DRILLED-IN ANCHORS**

1. Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC ES AC01 or ICC ES AC193.
  - a. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
  - b. Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be AISI Type 304 and Type 316 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. Stainless steel nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.



2. Screw Anchors: screw type. Pre-drilling of the hole requires a standard ANSI drill bit with the same diameter as the anchor and installing the anchor will be done with an impact wrench. Provide anchors with a diameter and anchor length marking on the head. Type and size as indicated on Drawings.
  3. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating equivalent to DIN EN ISO 4042
- D. Drill holes with rotary impact hammer drills using core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
1. Cored Holes: Where anchors are permitted to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Properly clean cored hole per manufacturer's instructions.
  2. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.
  3. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
  4. Perform anchor installation in accordance with manufacturer instructions.
  5. Wedge Anchors, Heavy-Duty Sleeve Anchors, and Undercut Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced unless otherwise directed by the Engineer.
  6. Cartridge Injection Adhesive Anchors: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
  7. Capsule Anchors: Perform drilling and setting operations in accordance with manufacturer instructions. Clean all holes to remove loose material and drilling dust prior to installation of adhesive. Remove water from drilled holes in such a manner as to achieve a surface dry condition. Capsule anchors shall be installed with equipment conforming to manufacturer recommendations. Do not disturb or load anchors before manufacturer specified cure time has elapsed.



8. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.

**E. REPAIR OF DEFECTIVE WORK**

1. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.
2. Testing: 10% of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory. Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Engineer. If more than 10% of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.
3. Tension testing should be performed in accordance with ASTM E488.
4. Torque shall be applied with a calibrated torque wrench.
5. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed  $D/10$ , where  $D$  is the nominal anchor diameter.

**F. Minimum anchor embedments, proof loads and torques shall be as shown on the Drawings.**

**G. Acceptable Manufacturers:**

1. Hilti (basis of Design)
  - a. For Anchoring into cracked concrete: Provide adhesive anchor system comparable to Hilti Injectable Mortar model # Hilti HIT-HY-200 (Accelerated). Utilize Hilti Anchor Rod, model Hilti HIT-Z,  $\frac{3}{8}$ " for pipe 2" and smaller,  $\frac{1}{2}$ " for pipe up to 3" and  $\frac{5}{8}$ " for pipe up to 4" and greater. Screw anchor is comparable to KH-EZ or Kwik HUS-EZ
  - b. For Anchoring into Hollow Masonry: Provide adhesive anchor system comparable to Hilti Injectable Mortar model # Hilti HIT-HY-70. When drilling into voids of existing hollow walls, provide adhesive composite screen model # Hilti HIT-SC with adhesive anchor system. Utilize Hilti Anchor Rod, model Hilti HAS,  $\frac{3}{8}$ " for pipe 2" and smaller,  $\frac{1}{2}$ " for pipe up to 3" and  $\frac{5}{8}$ " for pipe up to 4" and greater.
2. Powers
3. Redhead
4. Simpson Strong Tie
5. Approved Equal



### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements

#### **3.2 INSTALLATION**

- A. All piping shall be supported only from building structural steel or galvanized steel inserts imbedded in poured concrete. Where piping revisions are required after slabs are poured, pipes 3" and smaller may be supported at intermediate points by 3/4" expansion bolts and shields, provided main supports are not less than 20 feet on centers. All inserts, expansion bolts and shields in post-tensioned concrete slabs shall be submitted to the Commissioner for approval prior to commencement of work. Intermediate supports for piping 4" and larger shall be attached to concrete beams or columns by means of 4" x 4" x 3/8" (horizontal) and supporting rod at 90° from anchor bolt. It is the intent that inserts are only permitted in poured concrete construction.
- B. Hanger Locations for Horizontal Piping
  - 1. Steel Piping 1 1/4" and Smaller: Every 12 feet.
  - 2. Steel Piping (Schedule 40 and larger) 1 1/2" and Larger: Every 15 feet.
  - 3. Steel piping (less than schedule 40) 1 1/2" and larger: Every 12 feet.
- C. Support Locations for Vertical Piping
  - 1. Threaded & Mechanical Joint Piping: At every floor, but in no case greater than 20-foot intervals.
- D. Hangers shall be installed outside of piping insulation with a semi-cylindrical galvanized shield set between the hanger and insulation.
- E. All beam attachments shall be installed on clean, smooth, and non-fireproofed sections of the beam.
- F. All fire protection piping shall be hung individually from the structure.
- G. All hangers, anchors, rods and supports shall be painted.

**END OF SECTION 21 05 29**



**SECTION 21 05 53  
IDENTIFICATION OF FIRE SUPPRESSION PIPING AND EQUIPMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide fire protection systems identification in accordance with the Contract Documents.
- B. Provide a temporary fire standpipe system during construction.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 WORK INCLUDED**

- A. Labeling
- B. Valve and Equipment Tagging

**1.5 SUBMITTALS.**

- A. Product Data: Manufacturers' catalogs, brochures.
- B. Schedule: Provide schedule of colors to be used on each system.



## 1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Current Edition of the New York City Building Code (2014)
- C. NYC FDNY
- D. National Fire Protection Association (NFPA)
- E. Underwriters Laboratories (U.L.)

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. The following specifications represent desired design, materials and construction standards for the various items of work. Manufacturer names and model numbers are used to describe specific types, styles and quality.

### 2.2 PIPE LABELING

- A. All piping shall be identified by stenciled lettering, or self-adhesive pipe markers which legend conforms to OSHA/ANSI standards including but not limited to the identification of flow direction, pressure, supply/return, pump discharge, sprinkler, fire standpipe, dry sprinkler, etc.
- B. There shall be at least one lettering identification for each pipe in each space and at all valve locations.
- C. For painted identification use color sharply contrasting with background. If necessary, paint a strip background of black or white to obtain contrast.
- D. Vertical piping shall be labeled at each floor. Horizontal piping shall be labeled every 10', both sides of partitions, before and after turns, and close to valves and flanges.
- E. Each set consisting of one (1) band on which the name of the service is printed in black letters not less than 1½ inches high, and one (1) band on which is printed a black directional arrow. Apply bands where they can be easily read and with their long dimension parallel to the axis of the pipe. Provide bands with backgrounds of different colors from the various service groups.
- F. Adhesive Bands: provide pipe markings that meet ANSI (ASME) A13.1-2015 pipe marking guidelines, self-adhesive vinyl—to apply, peel and stick in place, temperature range is -40°F to 180° F, for use with dry and clean indoor pipes.



### **2.3 VALVE AND EQUIPMENT TAGGING**

- A. Tag valves with identifying number and system. Number valves by floor level.
- B. For valves, etc., use metal (brass, stainless steel or aluminum) tags, 3" minimum in diameter, with 1½" white painted letters with a red background. Attach tags with chain of same material.
- C. Prepare lists of all tagged valves showing location, floor level, tag number and use. Prepare separate lists for each system. Mount lists under a sheet of clear acrylic in Equipment Room. Include copies in each maintenance manual.
- D. Provide charts showing equipment lubrication points, lubrication required and frequency, and columns for date and initials.
- E. Stencil equipment with identifying letters and numbers as used on drawings. Where space is available use full name of equipment.
- F. Identify all controls such as motor starters not in motor control centers, float switches and alarms.

### **2.4 PAINTING**

- A. Comply with requirements in Section 099100 Painting for painting all exposed black steel piping, pipe covering, equipment and support piping and enclosures shall be given two coats of paint, applied and installed according to manufacturer direction.
- B. All pipe hangers, anchors and supports shall be given a zinc chromate primer before installation.

### **2.5 MANUFACTURERS**

- A. Pipe Labels
  - 1. W.H. Brady
  - 2. Seton
  - 3. Brimar Industries
  - 4. Approved equal.
- B. Valve Tags
  - 1. W.H. Brady
  - 2. Seton
  - 3. Brimar Industries
  - 4. Approved equal.



**PART 3 - PRODUCTS**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**END OF SECTION 21 05 53**



**SECTION 21 07 19  
INSULATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide pipe insulation in accordance with the Contract Documents.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit insulation shop drawings for each service.
- C. Product Data: Manufacturer's latest published data for materials, equipment and installation.

**1.4 WORK INCLUDED**

- A. Piping Insulation.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. ASTM C335
- C. ASTM C356
- D. ASTM C411
- E. ASTM C547



- F. ASTM E-84
- G. ASTM 225
- H. U.L.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Conform to application schedule specified herein for types and thicknesses of insulation.
- B. Provide insulation (including insulation jacket or facing and adhesives used to adhere the facing or jacket to the insulation) with non-combustible material meeting all NYC Building Code requirements and fire and smoke hazard ratings as tested by procedure ASTM E-84, National Fire Protection Association 225, and UL 723, not exceeding flame spread 25 and smoke developed 50.

### **2.2 PIPE INSULATION**

#### **A. Materials**

1. **Fiberglass Density:** All Fiberglass pipe insulation in equipment rooms and/or where exposed, to be of the sectional type having 6 lbs./cu. ft. density. All other fiberglass insulation to be of the 1-piece type having 4 lb. density.
2. Thermal conductivity of fiberglass to be 0.23 BTU/hr/inch/sq. ft./°F at a mean temperature of 75°F.
3. Thermal conductivity of calcium silicate to be 0.32 BTU/hr/inch/sq. ft./°F at a mean temperature of 100°F.

#### **B. Insulation Jackets**

1. **Pipes Concealed and Exposed:** Factory applied white fire-retardant jacket with self-sealing lap (ASJ) and butt strip. Ends of pipe insulation sealed off at valves, fittings and flanges with I.C. 301 or FB 30-35.
2. Vapor jacket permeability to be 0.02 perms.
3. Jacket Puncture Resistance to be 50 units (Beach).
4. **Piping Exposed to Outdoors:** Cover piping and fittings which are exposed to weather or called for to be weatherproofed, in addition to insulation and finishes specified for piping exposed to outdoors, with a polished aluminum jacket.



C. Application Schedule

1. Piping Exposed to Outdoors and Pipes Subject to Freezing: Cover any piping subject to freezing with 3" of glass fiber insulation.
2. For heat-traced piping, insulation must be sized to accommodate electric cable. Cover with an aluminum jacket, as specified for piping exposed to the weather.

D. Fittings, Valves and Flanges

1. Where manufactured, use factory premolded fittings (of the same material and thickness as the pipe insulation) for all fittings, flanges and valves.
2. Where premolded insulation fittings are not manufactured, insulate all fittings, flanges and valves with mitered segments of the same density as the adjoining pipe covering.
3. Insulate fittings, flanges, valves, etc. for services where calcium silicate insulation is specified as a pipe insulation with mineral wool cement of equal thickness to the pipe insulation and finished with glass cloth.

**2.3 MANUFACTURERS**

A. Insulation

1. Owens Corning Fiberglass
2. Johns Manville
3. Certain-Teed
4. Pittsburgh Corning
5. Approved Equal

B. Adhesives and Sealers

1. Benjamin Foster (B-F)
2. Insul-Coustic (I-C)
3. Certain-Teed
4. Minnesota Mining and Mfg. Co. (3M)
5. Approved Equal



### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements

#### **3.2 INSTALLATION OF INSULATION**

- A. Perform all work in strict accordance with the manufacturer's recommendation and the best practice of the trade and the intent of this specification.
- B. Apply all insulation over clean dry surface, butting all sections or surfaces firmly together and finishing as hereinafter specified.
- C. Seal all vapor barriers continuous and throughout against moisture penetration.

#### **3.3 PROTECTION OF INSULATION**

- A. Protect pipe insulation at hangers, guides, and rollers by 16 gauge galvanized metal shields (at least 3 times the insulation diameter in length and 1/3 the insulation circumference in width) on the outside of the insulation and vapor barrier. Hold shields in place by straps. Do not pierce the insulation with hangers. Where glass fiber insulation is used on piping 3" and larger, provide half-section of calcium silicate covering of equal thickness at metal shields.
- B. Do not use staples on vapor barrier jackets.

**END OF SECTION 21 07 19**



**SECTION 21 07 50  
ELECTRIC HEAT TRACING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide electric heat tracing in accordance with the Contract Documents.

**1.3 SUBMITTAL PROCEDURE**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 WORK INCLUDED**

- A. Electric Heat Tracing.

**1.5 SUBMITTALS**

- A. Shop Drawings: Equipment sizes, locations, performance data, installation details, wiring diagrams, and controls.
- B. Product Data: Manufacturer's latest published data for materials, equipment and installation.
- C. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

**1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Underwriters Laboratories.



- C. National Electric Code.

## **PART 2 - PRODUCTS**

### **2.1 ELECTRIC HEAT TRACING CABLE**

#### **A. Heat Trace Cable and Installation**

1. Heat trace all exposed piping, including sprinkler branches where applicable, using a single linear strip of self-regulating, radiation cross-linked, heater cable with a tinned copper braid and modified polyolefin outer jacket, rated for use in fire protection systems, or engineered approved equal.
  - a. The wattage of the freeze protection cable and piping insulation shall be as follows:
    - 1) Up through 3" pipe, 1" insulation, 1 strip 5XL (5 watt/ft) for protection to -20F
    - 2) Up through 12" pipe, 2" insulation, 1 strip 8XL (8 watt/ft) for protection to -20F
2. Components shall be quick connect type rated for rated 30 AMPS, NEMA 4X enclosures: tees and splices; end seals (silicone gel type); fiberglass tape and electric traced labels; as required. Lighted end seals shall be installed for critical end of line power verification where indicated. All components, except the power connections and any lighted end seals, shall be installed under the thermal insulation.
3. Power shall be 120 volts, single phase. Ground fault protect shall be provided by the heat trace system controller.

#### **B. Controls**

1. The system shall be field-mounted and shall have FM or CSA approval for Class I, Division 2, Groups A, B, C, D when using a solid-state switching device.
2. The system shall provide the user with the option of line-sensing control with a user-selectable dead band, ambient sensing, proportional ambient sensing (PASC), and power limiting control modes.
3. Enclosure type shall be NEMA 4X fiberglass reinforced plastic (FRP) for corrosion resistance and protection from moisture.
4. Each heater cable shall be individually controlled by a line temperature sensing device. The RTD shall be located on each pipe as indicated on the contract drawings. The RTD shall be provided with armored lead wires to prevent damage. Failure of a temperature sensor shall be indicated at the system monitor panel and shall result in activation of the heater cable. Mechanical thermostats shall not be used.
5. Install RTD temperature sensor(s) in worst case location or as indicated by the Commissioner. The sensor(s) shall be installed in conduit, loose, allowing for future removal & replacement if needed, under the insulation. Extend the conduit a minimum of five (5) feet along the buried piping run and seal the seal both ends. Pipe mounted sensors to be located on opposite side of pipe from heater cable. Avoid installation of temperature sensors near vents, steam lines or other heated locations.



6. The monitor system shall provide UL Listed GFI protection for all branch heater cable circuits per NEC 1996 Section 423-22. GFI shall have a 30 mA trip level. Monitor system shall provide High GFI Current warning at 20 mA.
7. Each heater cable including all tees shall be monitored and provide alarms for high and low current.
8. Fire Suppression System Freeze Protection: Minimum of two (2) RTD temperature sensors shall be employed. An ambient sensing RTD shall energize the heater cables when the ambient air temperature drops to 40 °F. A second RTD, installed on the smallest pipe in the coldest location, beneath the insulation, shall activate the Low Pipe Temperature alarm at 35 °F.
9. Freeze protection systems shall activate the Low Pipe Temperature alarm at 35 °F.
10. Each monitor channel shall have autocycling capability for monitoring cable during the entire year. All setpoints and diagnostics shall be stored in non-volatile memory. Alarms shall be provided for memory and failures.
11. The control system shall provide as standard the following alarm outputs:
  - a. Dry contact to BMS for common alarm (Low Pipe Temperature, Ground Fault Alarm/Trip, and Loss of Power);

C. Source Quality Control

1. Obtain material from the Product Manufacturer's Authorized Sales, Service and Warranty Representative.

D. Manufacturers

1. Raychem Corporation
  - a. Raychem Model 5XL1-CR and Model 5XL1-CR (basis of design)
  - b. Controller: Raychem DigiTrace C910-485 (basis of design)
2. Nelson Electric
3. Pentair Thermal Systems
4. Chromalox
5. Approved Equal



**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**3.2 FIELD QUALITY CONTROL, TESTING & WARRANTY**

- A. The installing contractor shall perform tests in accordance with the manufacturer's Installation and Operation Manual. The installing contractor is responsible for testing runs of cable during installation, at the conclusion of work each day, prior to walls or ceilings being closed. Testing includes resistance testing with a 2500 VDC megohmmeter (megger) to insure cable integrity, capacitance testing to verify installed length and continuity and visual inspection for damage and conformity to design.
- B. Provide as-built diagrams of the tracing installation including locations of all controllers, power connections, tee's, splices, standard and lighted end terminations and circuit identification of breakers with their corresponding piping.
- C. The Contractor shall coordinate final system start-up / testing of completed system sections with the Commissioner, Manufacturer's Representative and the subcontractor. Final testing shall be witnessed by the Commissioner and Manufacturer's Representative.
- D. Submit records of circuit number, circuit length, all test data (final megger and capacitance readings and power drawn per circuit at design temperature), satisfactory completion of final commissioning.

**END OF SECTION 21 07 50**



**SECTION 21 12 00  
STANDPIPE AND HOSE SYSTEMS**

**PART 1- GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide a complete wet and/or dry standpipe and temporary fire standpipe system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. All piping, equipment, hangers, etc., as specified herein, as shown on drawings.
- B. Fire Hose and Nozzles
- C. Accessories for Valves and Hoses
- D. Roof Manifold

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Manufacturers' catalogs, brochures and equipment.
- C. Shop Drawings: Detail construction drawings indicating materials, performance data, and piping layouts, and fire standpipe equipment layouts, etc.



## **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. NFPA
- C. Current Edition of the NYC Building Code (2014)

## **PART 2- PRODUCTS**

### **2.1 GENERAL**

- A. All threads shall conform to FDNY requirements.

### **2.2 1½" HOSE RACK**

Provide new 2½" fire department hose valve, with red enamel steel hose rack, 2½" brass hose rack nipple, 2½" x 1½" brass reducer, 1½" brass pin lug coupling, 1½" lined poly flex hose (125'), 1½" brass nozzle and 2½" escutcheon

### **2.3 ROOF MANIFOLD**

- A. Provide new roof manifold valve assembly, rated for 250 GPM flow (minimum), per 2-1/2" outlet, three-way cast brass angle inlet body.

### **2.4 MANUFACTURERS FOR HOSE RACK AND ROOF MANIFOLD**

- 1. Potter-Roemer
- 2. Elkhart Brass
- 3. Croker
- 4. Guardian
- 5. Approved equal



### **PART 3- EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 INSTALLATION**

- A. Pipe and Fittings
  1. Threads shall be full and clean cut. All threaded pipe shall be reamed or filed to original bore of pipe and all burrs shall be removed. Care shall be taken that the pipe does not extend into the fitting obstructing the waterway. Teflon tape shall be applied to the threads of the pipe and not to the fittings.
  2. A one-piece reducing fitting shall be used wherever a change is made in the size. The use of bushings or reducing flanges will not be permitted.
  3. Unions shall be provided at connections to each piece of equipment for easy dismantling.
  4. All control valves, pressure reducing valves, check valves, water flow switches, pressure switches, etc., shall be easily accessible for maintenance and removal.
  5. Only shoulder nipples shall be used. Close nipples will not be acceptable.

#### **3.3 TESTS**

- A. During the progress of the work, test the fire standpipe systems piping. Such tests shall be made in the presence of the Commissioner.
- B. The piping shall be tested in accordance the NYC building code Appendix Q and NFPA Code requirements, but in no case shall the system be tested at less than 200 psig hydrostatic pressure for one (1) hour.
- C. Defects disclosed by the tests shall be repaired or replaced with new work. Tests shall be repeated as directed, until all work is proven satisfactory.
- D. Take due precautions to prevent damage to the building and its contents as a result of such tests. Repair any damage caused.
- E. During construction, properly cap all lines and equipment nozzles so as to prevent the entrance of sand, dirt, etc. Each system of piping shall be flushed to remove grit, dirt, sand, etc., from the piping for as long a time as is required to thoroughly clean the system.

**END OF SECTION 21 12 00**



**Department of  
Design and  
Construction**

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**SECTION 21 13 13  
WET PIPE SPRINKLER SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide a complete wet pipe sprinkler system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Sprinkler Heads.
- B. Tamper Switch
- C. Inspectors Test Connection

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings
  - 1. Dimensioned sprinkler layouts.
  - 2. Identification chart and tags for valves and alarm devices.
  - 3. Hydraulic calculations.
- C. Permits and Approvals
  - 1. Arrange and pay for all permits, approvals and tests.



## 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Factory Mutual
- C. NFPA 13
- D. National Electric Code
- E. NYC FDNY
- F. Current Edition of NYC Building Code (2014)

## PART 2 - PRODUCTS

### 2.1 SPRINKLER HEADS

- A. Spray type, with ½" nominal discharge orifice. Ordinary temperature rating 160° - 175° throughout except where special conditions exist which will require higher temperature sprinklers or when indicated on the drawings. All heads shall be U.L. listed.
- B. QUICK RESPONSE STANDARD COVERAGE SPRINKLERS
  - 1. Pendant, upright, horizontal sidewall, and semi-recessed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Sprinklers shall have a quick response frangible bulb type fusible element. Sprinklers to be installed in areas with no ceilings shall be of a brass finish and shall be of adequate temperature for the hazard semi-recessed heads shall have chrome plated recessed escutcheon. Sprinkler head shall have K8.0, ½" orifice rated for Ordinary Hazard usage.
  - 2. Concealed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Quick response concealed pendent sprinkler orifice shall be standard nominal ½" with a K factor of 5.6. Quick response concealed pendent sprinklers shall be listed for installation in an ordinary hazard occupancy if installed in an ordinary hazard occupancy. Concealed pendent sprinkler shall have a cover that is a push-on, thread-off assembly. Quick response concealed pendent sprinklers shall have K5.6, ½" orifice.
- C. STANDARD RESPONSE, STANDARD COVERAGE – only for use where indicated on plans
  - 1. Upright, pendant, semi-recessed: Sprinklers shall be of all brass frame construction utilizing a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Sprinkler orifices shall be standard nominal ½" with K factors of 5.6 and 8.0, respectively. Sprinklers shall have a frangible bulb type fusible element. Sprinklers to be installed in areas with no ceilings shall be of a brass finish and shall be of adequate temperature for the hazard. Sprinklers to be installed through a ceiling shall be a finished pendent sprinkler with an



adjustable semi-recessed escutcheon of same specified finish. Sprinklers shall be UL listed and Factory Mutual approved.

2. Concealed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Concealed pendent sprinkler shall have cover plate that is a push-on, thread-off assembly with a 2 $\frac{3}{4}$ " diameter. Concealed pendent sprinkler orifice shall be standard nominal  $\frac{1}{2}$ " with a K factor of 5.6. Concealed pendent sprinklers shall be listed for installation in an ordinary hazard occupancy if installed in an ordinary hazard occupancy.

## **2.2 TAMPER SWITCH**

- A. Valve supervisory switches shall be on each valve as designated on the drawings. Switches shall be mounted so not to interfere with the normal operation of the valve and shall be adjusted to operate within two revolutions of the valve control or when the stem has moved no more than one-fifth of the distance from its normal position. The switch mechanism shall be contained in a weatherproof die-cast aluminum housing which shall provide 3/4" tapped conduit entrance and incorporate the necessary facilities for attachment to the valve. Switch housings shall be finished in red baked enamel. The switch mechanism shall have a minimum rated capacity of 7 amp, 125 volt, 0.25 amp., 24 volt D.C. The entire assembly shall be tamper proof and arranged to cause a switch operation if the housing cover is removed or if the unit is removed from its mounting.

## **2.3 INSPECTOR'S TEST CONNECTIONS**

- A. Bronze female pipe connection with orifice equivalent to one sprinkler head flow of 5.6K; unless larger orifice sprinkler is utilized in space.

## **2.4 MANUFACTURERS**

- A. Sprinkler Manufacturers
  1. Reliable
  2. Globe
  3. Viking
  4. Victaulic
  5. Approved Equal
- B. Tamper Switch
  1. Potter-Roemer
  2. Potter Electric
  3. Reliable



4. Victualic
  5. Approved Equal
- C. Inspector Test Assembly Manufacturers
1. Reliable
  2. Globe
  3. Viking
  4. Victaulic
  5. Approved Equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 GENERAL**

- A. The contract documents do not relieve Contractor's responsibility to provide all work and equipment necessary to complete the installation in accordance with all requirements.

#### **B. INSTALLATION**

1. No pipes or other apparatus shall be installed so as to interfere in any way with the full swing of the doors. The arrangement, positions and connections of pipes, drains, valves, etc., shown on the drawings, shall be taken as a close approximation and while they shall be followed as closely as possible, the right is reserved by the Commissioner to change the locations to accommodate any conditions which may arise during the progress of the work without additional compensation to this contractor for such changes, provided that the changes are requested prior to the installation of this work.
2. All piping shall drain back to the risers or be provided with drain valves. Special precautions must be taken to avoid electrical work and ventilation ducts, and no piping shall pass below lighting fixtures in luminous ceilings or under skylights.
3. All piping shall be unexposed except in no-ceiling areas. Where required, heads shall be located below ducts. Diffusers and lighting fixtures take preference in room layout.
4. In areas with restricted head room, heads and piping shall be tight to ceilings and provided with guards.



5. No heads shall be nearer than 6 inches to a ceiling support, and where 12" x 12", 24" x 24" or 24" x 48" ceiling panels are used, the heads shall be located in the center of the panel.
6. Install sprinkler heads in all areas on a true axis line in both directions with a maximum deviation from the axis line of 1/2" plus or minus. In acoustical tile ceilings, sprinkler heads shall be located on center of tile. At the completion of the installation, remove and reinstall any heads found to exceed the abovementioned tolerances.
7. Where sprinklers are installed in areas without hung ceiling, install sprinklers both above and below all ductwork 48" and larger in width or where the total aggregate of multiple ducts exceeds 48" in width or length.

**3.3 SPRINKLER COVERAGE**

- A. For determination of sprinkler systems, spacing and sizing, the following coverage ratings as listed in NFPA 13 shall be followed.
- B. Provide sprinklers where shown on the drawings.
- C. Provide a minimum of six heads additional sprinkler heads of each type and temperature rating used and two suitable socket wrenches, contained in neat steel boxes, suitable for use as a service kit on the job. The steel boxes shall be installed in the building identified fire command center.
- D. **Hydraulically Calculated System:** The system shall be hydraulically designed to provide a density based on NFPA requirements.

AREA	HAZARD CLASSIFICATION	DENSITY GPM/SQ. FT.	AREA OF APPLICATION
General Public Areas.	Light	0.10	1500
Parking	Ordinary	0.16	1500
Mechanical Retail Shops	Ordinary	0.16	1500
Offices	Light	0.10	1500



**3.4 DRAINS AND TEST PIPES**

- A. Provide drains at base of riser, valved sections inside building, and at other locations indicated or requiring same for complete drainage of systems. Siamese drains shall be automatic ball drips. Other drains shall be valves and/or plugs as indicated and/or required. Pipe drains to locations as required.
- B. Test pipes shall be valved and piped to discharge through proper orifice at approved locations.

**END OF SECTION 21 13 13**



**SECTION 21 13 16  
DRY PIPE SPRINKLER SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
1. The Contract Drawings
  2. The Specifications
  3. The General Conditions
  4. The Addendum
  5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide a complete dry pipe sprinkler system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Sprinkler Heads  
B. Piping, Fittings and Valves

**1.4 WORK EXCLUDED**

- A. Pressure Switches.  
B. Tamper Switch.  
C. Dry Pipe Valve and Accelerator.  
D. Air Compressor.  
E. Air Maintenance Device.

**1.5 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".



- B. Shop Drawings
  - 1. Dimensioned sprinkler layouts.
  - 2. Identification chart and tags for valves and alarm devices.
  - 3. Hydraulic calculations.
- C. Permits and Approvals
  - 1. Arrange and pay for all permits, approvals and tests.

## 1.6 QUALITY ASSURANCE

- A. FM Global
- B. NFPA 13
- C. National Electric Code.
- D. Current Edition of the NYC Building Code (2014)
- E. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

## PART 2 - PRODUCTS

### 2.1 SPRINKLER HEADS

- A. Spray type, with ½" nominal discharge orifices is recommended. Ordinary temperature rating 160° - 175° throughout except where special conditions exist which will require higher temperature sprinklers or when indicated on the drawings. All heads shall be U.L. listed.
- B. QUICK RESPONSE STANDARD COVERAGE SPRINKLERS
  - 1. Pendant, upright, horizontal sidewall, and semi-recessed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Sprinklers shall have a quick response frangible bulb type fusible element. Sprinklers to be installed in areas with no ceilings shall be of a brass finish and shall be of adequate temperature for the hazard semi-recessed heads shall have chrome plated recessed escutcheon.
  - 2. Concealed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Quick response concealed pendent sprinkler orifice shall be standard nominal ½" with a K factor of 5.6. Quick response concealed pendent sprinklers shall be listed for installation in an ordinary hazard occupancy if installed in an ordinary hazard occupancy. Concealed pendent sprinkler shall have a cover that is a push-on, thread-off assembly.



- C. STANDARD RESPONSE, STANDARD COVERAGE – only for use where indicated on plans
1. Upright, pendant, semi-recessed: Sprinklers shall be of all brass frame construction utilizing a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Sprinkler orifices shall be standard nominal ½” with K factors of 5.6 and 8.0, respectively. Sprinklers shall have a frangible bulb type fusible element. Sprinklers to be installed in areas with no ceilings shall be of a brass finish and shall be of adequate temperature for the hazard. Sprinklers to be installed through a ceiling shall be a finished pendent sprinkler with an adjustable semi-recessed escutcheon of same specified finish.
  2. Concealed: Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Concealed pendent sprinkler shall have cover plate that is a push-on, thread-off assembly with a 2¾” diameter. Concealed pendent sprinkler orifice shall be standard nominal ½” with a K factor of 5.6.
- D. Furnish and install approved sprinkler head wire guards for all sprinkler heads located 7'-6" or lower above finished floor level.
- E. Provide a minimum of six heads additional sprinkler heads of each type and temperature rating used and two suitable socket wrenches, contained in neat steel boxes, suitable for use as a service kit on the job. The steel boxes shall be installed in the building identified fire command center.

## 2.2 MANUFACTURERS

- A. Sprinkler Heads
1. Globe
  2. Reliable
  3. Central
  4. Viking
  5. Grinnell
  6. Approved equal

## PART 3 - EXECUTION

### 3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



### **3.2 GENERAL**

- A. The contract documents do not relieve Contractor's responsibility to provide all work and equipment necessary to complete the installation in accordance with all requirements.

### **3.3 INSTALLATION**

- A. No pipes or other apparatus shall be installed so as to interfere in any way with the full swing of the doors. The arrangement, positions and connections of pipes, drains, valves, etc., shown on the drawings, shall be taken as a close approximation and while they shall be followed as closely as possible, the right is reserved by the Commissioner to change the locations to accommodate any conditions which may arise during the progress of the work without additional compensation to this contractor for such changes, provided that the changes are requested prior to the installation of this work.
- B. All piping shall drain back to the risers or be provided with drain valves. Special precautions must be taken to avoid electrical work and ventilation ducts, and no piping shall pass below lighting fixtures in luminous ceilings or under skylights.
- C. All piping shall be unexposed except in no-ceiling areas. Where required, heads shall be located below ducts. Diffusers and lighting fixtures take preference in room layout.
- D. In areas with restricted head room, heads and piping shall be tight to ceilings and provided with guards.
- E. No heads shall be nearer than 6 inches to a ceiling support, and where 12" x 12", 24" x 24" or 24" x 48" ceiling panels are used, the heads shall be located in the center of the panel.
- F. Install sprinkler heads in all areas on a true axis line in both directions with a maximum deviation from the axis line of 1/2" plus or minus. In acoustical tile ceilings, sprinkler heads shall be located on center of tile. At the completion of the installation, remove and reinstall any heads

### **3.4 SPRINKLER COVERAGE**

- A. For determination of sprinkler system, spacing and sizing, the coverage ratings as listed in shall be followed.
- B. Provide sprinklers where shown on the drawings
- C. **Hydraulically Calculated System:** Automatic sprinklers throughout the entire area shall be installed as hydraulically calculated systems to provide a density as noted on the contract documents.

**END OF SECTION 21 13 16**



**SECTION 22 05 17  
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide sleeves and U.L. approved firestopping system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Sleeves
- B. Firestop Compounds.

**1.4 SUBMITTAL PROCEDURE**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit shop drawings, product data, and manufacturer's installation instructions for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site. Literature shall indicate product characteristics, typical use, performance and limitation criteria and test data.
- C. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details shall accurately reflect actual job conditions.
- D. Submit Material Safety Data Sheets with product delivered to job site.
- E. U.L. Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which firestop materials will be used and thickness for different hourly ratings, and approved UL system number.
- F. Submit manufacturer's installation procedures for each type of product.



- G. Upon completion, installer shall provide written certification that materials were installed in accordance with the manufacturer's installation instruction and details.

## **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Firestop system installation shall conform to requirements of qualified designs or manufacturer approved modifications, as supported by engineering reports. Field inspections shall be carried out by the firestop manufacturer to verify that the installation is in accordance with the manufacturer requirements.
- C. Install firestop materials and systems as required by these Contract Documents and meet and be accepted for use by UL (Underwriters Laboratories).
- D. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials (firestop system) meets the requirements specified in accordance with the applicable referenced standards.
- E. The firestop compound shall not contain any solvents or inorganic fibers. The penetration seal material must be unaffected by moisture and must maintain the integrity of the floor or wall assembly for its rated time period when tested in accordance with ASTM E814 (UL1479). The system shall be U.L. Classified for up to and including 3 hours.
- F. Firestopping materials shall be asbestos and lead free and shall not incorporate or not require the use of hazardous solvents.
- G. Firestopping sealants must be flexible, allowing for normal pipe movement.
- H. All fire stopping materials shall be manufactured by one manufacturer.
- I. Installation of firestopping systems shall be performed by a Contractor properly trained by the firestop manufacturer.
- J. Material used shall be in accordance with the manufacturer's written installation instructions.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. The following specifications represent desired design, material, and construction standards for the various items of work. Manufacturer names and model numbers are used to describe specific types, styles and quality.

### **2.2 SLEEVES**

- A. Provide sleeves for each pipe passing through walls, partitions, and floors.
- B. Sleeve Sizes



2. Sleeves shall provide a minimum 1" clearance around pipes smaller than 4" and 2" clearance around pipes 4" and larger.
- C. Provide sleeves for each pipe passing through walls, partitions, and floors.
- D. Sleeve Materials (unless otherwise specified)

Type	Sleeve Materials
1	# 18 gauge, galvanized steel for between wall construction
2	Standard weight steel pipe for passing through structural slabs or openings; Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

E. Sleeve Lengths

Location	Sleeve Length
Floor	All floor sleeves to extend minimum of 2" above finished floor level.
Stair Landing	Equal to depth of construction and terminated flush with finished surfaces.
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces.

F. Foundation Wall Penetrations

1. The pipe to wall sleeve penetration closure shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve opening; refer to approved manufacturers within specification below. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide a watertight seal between the pipe and wall opening. The seal shall be constructed so as to provide electrical insulation between the pipe and wall, thus reducing chances of cathodic reaction between these two members.
2. Contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabricating or installing. The inside diameter of each wall opening shall be sized as recommended by the manufacturer to fit the pipe to assure a watertight joint. If pipe O.D. is non-standard due to coating, insulation, etc., consult manufacturer for assistance before proceeding with wall opening detail.
3. Suitable for direct ground burial, normal atmospheric conditions, and conditions with occasional or periodic water contact. Provides electrical isolation where cathodic protection is required.



4. Seal Element shall be EPDM, with Pressure Plates of Reinforced Nylon Polymer, Bolts & Nuts: Steel with 2-part Zinc Dichromate & corrosion inhibiting coating, rated for Temp. Range: -40° to 250°F (-40° to 121°C).

G. GROUT

1. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout. Characteristics: Non-shrink; recommended for interior and exterior applications. Design Mix: 5000-psi, 28-day compressive strength. Packaging: Premixed and factory packaged

**2.2 FIRESTOPPING**

- A. Provide firestop compounds for caulk, pour, trowel or pump application. Material must be capable of sealing openings around single or multiple pipes against fire, smoke and toxic gases, and maintaining rating with a thickness no greater than the structure.
- B. Provide a damming material, where required, per manufacturer's recommendations and as shown on the Drawings.
- C. Provide a firestop system consisting of a material, or combination of materials, to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke or gases through penetrations in fire-rated barriers. It shall be used in specific locations as follows:
  1. Penetrations for the passage of piping through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
  2. Locations shown specifically on the drawings or where specified in other sections of these specifications.
- D. MATERIALS
  1. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating item(s) without affecting the adhesion or integrity of the system.
  2. Firestopping materials shall not require hazardous waste disposal of used containers/packages.
  3. Provide firestopping materials free of solvents which will not experience shrinkage while curing.
  4. Firestopping materials shall be unaffected by moisture.
- E. Sleeve Manufacturers
  1. Link Seal
  2. Calpico Inc, Pipe Linx
  3. Metraflex



4. CCI Piping Systems
  5. Hilit
  6. Approved equal
- F. Firestopping Manufacturers
1. Hilti FS-One Max
  2. Specified Technologies, Inc.
  3. Dow Corning
  4. Flamesafe
  5. International Protective Coatings
  6. Approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

- 3.2 Deliver materials to site in original unopened containers or packages bearing the manufacturer's name, brand designation, product description and U.L. Classification Mark.
- 3.3 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job site.
- 3.4 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- 3.5 Comply with recommended procedures, precautions or remedies described in Material Safety Data Sheets as applicable.

#### **3.6 EXAMINATION**

- A. Examine areas and conditions under which work is to be performed and notify the Commissioner in writing of conditions detrimental to proper and timely completion of the work.
- B. Verify that openings are properly sized and in suitable condition to receive the work of this section.
- C. Verify manufacturer's printed instructions for installation and when applicable, curing in accordance with temperature and humidity. Conform to ventilation and safety requirements.



- D. Verify the condition of the substrates before starting work.
- E. Verify Weather Conditions. Do not proceed with installation of firestop materials when temperatures fall outside the manufacturer's suggested limits.
- F. Verify that firestopping materials are installed so as not to contaminate adjacent surfaces.
- G. Schedule firestopping after installation of penetrants but prior to concealing the openings.
- H. Where firestopping is installed at locations which will remain exposed in the completed work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as necessary against damage from other construction activities.
- I. Verify that all pipe, conduit, ducting which penetrate fire-rated construction have been permanently installed prior to installation of firestop.

### **3.7 PREPARATION**

- A. Clean substrate of dirt, dust, grease, oil, loose materials, rust or other matter that may affect the proper fitting or adhesion of the firestopping materials.
- B. Clean metal and glass surfaces with a non-alcohol solvent.

### **3.8 INSTALLATION**

- A. Installation of firestops shall be performed by an applicator/installer qualified and properly trained by the manufacturer. Installation shall be performed in strict accordance with manufacturer's details installation procedures.
- B. Apply firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, and manufacturer's recommendations.
- C. Unless specified and approved, all insulation used in conjunction with through-penetrations shall remain intact and undamaged and may not be removed.
- D. Seal holes and penetrations to ensure an effective smoke seal.
- E. In areas of high traffic, protect firestopping materials from damage.
- F. Insulation types specified in other sections shall not be installed in lieu of firestopping material specified herein.
- G. All combustible penetrants (e.g. non-metallic pipes or insulated metallic pipes) shall be firestopped using products and systems tested in a configuration representative of the field condition.



H. Dam Construction

1. When required to properly contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming material must be removed after appropriate curing. Noncombustible damming materials may be left as a permanent component of the firestopping system.
2. Firestopping may be required by other Subcontractors under related sections of the project specifications. Identify all locations requiring firestopping and coordinate the work of this section with work performed under other sections of the project to provide a uniform system of firestopping.
3. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
4. Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation.
5. Firestop systems do not re-establish the structural integrity of load bearing partitions. Contractor shall consult the Commissioner prior to penetrating any load bearing assembly.
6. Firestop systems are not intended to support live loads or traffic. Contractor shall consult the Commissioner if he has reason to believe these limitations may be violated.
7. The installation of firestop materials shall be inspected on site by a representative of the firestopping manufacturer and verified in writing that the installation is in accordance with the manufacturer's requirements. This shall be done for each firestop penetration installed on this project.

**3.9 FIRESTOPPING**

A. Un-Insulated Cold Pipes

1. Install a pipe sleeve through the wall or slab to be penetrated with an inside diameter large enough to include the specified pipe and firestopping.
2. Install firestop material at each end of sleeve to form a U.L. approved system.
3. Mark penetration in an approved manner to verify manufacturer's inspection.
4. Cover firestopping with escutcheon cover.

B. Insulated Cold Pipes

1. Install a pipe sleeve through the wall or slab to be penetrated with an inside diameter large enough to include the specified thickness of insulation.
2. Pipe insulation should be continuous through sleeve. Insulation should be covered with a vapor barrier. For depth of wall plus 1" on either side of wall or slab, vapor barrier shall be wrapped with a 26 gauge sheetmetal inner sleeve. Firestop shall be applied between wall sleeve and pipe protection sleeve.



3. Install firestop material at each end of sleeve to form a U.L. approved system.
4. Mark penetration in an approved manner to verify manufacturer's inspection.
5. Cover firestopping with escutcheon cover.

**C. Hot Pipes (Up to 220°F)**

1. Install a pipe sleeve through the wall or slab to be penetrated with an inside diameter large enough to include the specified thickness of insulation.
2. Pipe insulation should be continuous through sleeve. Insulation should be covered with a vapor barrier. For depth of wall plus 1" on either side of wall or slab, vapor barrier shall be wrapped with a 26 gauge sheetmetal inner sleeve. Firestop shall be applied between wall sleeve and pipe protection sleeve.
3. Insulate pipe on each of wall and caulk all around insulation at joint of wall and insulation.
4. Mark penetration in an approved manner to verify manufacturer's inspection.
5. Cover firestopping with escutcheon cover.

**3.10 FIELD QUALITY CONTROL**

- A. Prepare and install firestopping systems in accordance with manufacturer's printed instruction and recommendations.
- B. Follow safety procedures recommended in the Material Safety Data Sheets.
- C. Finish surfaces of firestopping which are to remain exposed in the completed work to a uniform and level condition.
- D. All areas of work must be accessible until inspection by the applicable special inspector.
- E. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification.

**3.11 CLEANING**

- A. Remove spilled and excess materials adjacent to firestopping without damaging adjacent surface.
- B. Leave finished work in neat, clean condition with on evidence of spill overs or damage to adjacent surfaces.

**END OF SECTION 22 05 17**



**SECTION 22 05 29  
HANGERS, SUPPORTS, ANCHORS, GUIDES, AND SEISMIC RESTRAINT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

A. The following documents apply to all required work for the Project:

1. The Contract Drawings
2. The Specifications
3. The General Conditions
4. The Addendum
5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

A. Work of this Section shall conform to the requirements of the Contract Documents.

**1.3 WORK INCLUDED**

- A. Hangers equipment.
- B. Supports

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Manufacturer's literature, catalog data and illustrations.
- C. Shop Drawings indicating:
  1. Dimensions
  2. Construction details of hangers, inserts, anchors and guides
  3. Materials
  4. Maximum Load
  5. Locations



6. Recommended installation procedures

## **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Codes references:
  1. ASA Code for Pressure Piping
  2. ASTM A-575-73
  3. MSS SP-58-67
  4. MSS SP-69-66
  5. Underwriters Laboratories
  6. Current edition of NYC Plumbing Code (2014)

## **PART 2 - PRODUCTS**

### **2.1 HANGERS**

- A. All bracket, clamp and rod sizes indicated in this specification are minimum sizes only. All structural hanging materials shall have a built-in safety factor of 5.
- B. Provide rolled-steel auxiliary pipe supports as required.
- C. Anchor points shall be located and constructed to permit the piping system to take up its expansion and contraction freely in opposite directions from the anchored points.
- D. Guide points shall be located and constructed wherever required or shown on drawings and at each side of an expansion joint or loop, to permit free axial movement only in a piping system.
- E. All hangers shall be U.L. listed and FM approved.
- F. C-clamps with locknut and retaining clip will be permitted.

### **2.2 GENERAL SUPPORT AND ANCHORAGE**

- A. Provide pipe and equipment hangers and supports in accordance with the following:
  1. When supports and anchorages for tanks, equipment, conduit, and piping are not shown on the drawings, the Contractor shall be responsible for their design.



2. Supports and anchorages shall not introduce stresses in the piping caused by thermal expansion or contraction.
  3. Connections to structural framing shall not introduce twisting, torsion, or lateral bending in the framing members. Provide supplementary steel as required.
- B. Fabricate support members from welded standard structural shapes, pipe, and plate. Carry the necessary rollers, hangers, and accessories as required. Piping less than 4-inch pipe size may be supported from or by prefabricated roll-formed channels as specified in this section with necessary accessories to adequately support piping system.
- C. Supports and Accessories: Preformed roll-formed channels and accessories with matching compatible accessories as shown, as specified, and as required.
- D. Manufacturers:
1. B-Line Systems
  2. Grinnell
  3. Powerstrut
  4. Superstrut
  5. Unistrut
  6. Approved Equal

### **2.3 PIPE ATTACHMENTS**

- A. Insulated Horizontal Steel Piping: Grinnell Fig. 300. Fig. 260 with Fig. 167 shield, or comparable figure from the following Manufacturers:
1. B-Line Systems
  2. Superstrut
  3. Telco
  4. Approved equal.
- B. Uninsulated Horizontal Steel Piping: Grinnell Fig. 260 or comparable figure from the following Manufacturers:
1. B-Line Systems
  2. Superstrut



- 3. Telco
- 4. Approved equal.

C. Riser Clamps, Steel Pipe: Grinnell Fig. 261 or comparable figure from the following Manufacturers:

- 1. B-Line Systems
- 2. Superstrut
- 3. Telco
- 4. Approved equal.

D. Beam Hangers: Beam Clamps: Grinnell Fig. 228 or comparable figure from the following Manufacturers:

- 1. B-Line Systems
- 2. Superstrut
- 3. Telco
- 4. Approved equal.

E. Hanger Rod Schedule: Carbon Steel Rod, electro-galvanized Finish

Pipe Size	Rod Diameter
4" and smaller	3/8"
5", 6", & 8"	5/8"
10" & above	3/4"

- 1. Manufacturers:



- a. B-Line Systems
- b. Grinnell (basis of design)
- c. Superstrut
- d. Telco
- e. PHD
- f. Approved equal.

## **2.4 CONCRETE POST INSTALLED ANCHORS**

### **A. Installer Qualifications:**

1. Drilled-in anchors shall be installed by an Installer with experience performing similar installations.
2. Installer Training: Conduct a thorough training with the manufacturer or the manufacturer's representative for the installer on the project. Training to consist of a review of the complete installation process for drilled-in anchors, to include but not limited to:
  - a. hole drilling procedure
  - b. hole preparation & cleaning technique
  - c. adhesive injection technique & dispenser training / maintenance
  - d. rebar dowel preparation and installation
  - e. proof loading/torquing

### **B. Certifications: Unless otherwise authorized by the Engineer, anchors shall have one of the following certifications:**

1. ICC ES Evaluation Report indicating conformance with current applicable ICC ES Acceptance Criteria.

### **C. DRILLED-IN ANCHORS**

1. Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC ES AC01 or ICC ES AC193.
  - a. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
  - b. Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be AISI Type 304 and Type 316 stainless steel provided with stainless steel nuts and washers



of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. Stainless steel nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.

2. Screw Anchors: screw type. Pre-drilling of the hole requires a standard ANSI drill bit with the same diameter as the anchor and installing the anchor will be done with an impact wrench. Provide anchors with a diameter and anchor length marking on the head. Type and size as indicated on Drawings.
  3. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating equivalent to DIN EN ISO 4042
- D. Drill holes with rotary impact hammer drills using core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
  - E. Cored Holes: Where anchors are permitted to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Properly clean cored hole per manufacturer's instructions.
  - F. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.
  - G. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
  - H. Perform anchor installation in accordance with manufacturer instructions.
  - I. Wedge Anchors, Heavy-Duty Sleeve Anchors, and Undercut Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced unless otherwise directed by the Engineer.
  - J. Cartridge Injection Adhesive Anchors: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
  - K. Capsule Anchors: Perform drilling and setting operations in accordance with manufacturer instructions. Clean all holes to remove loose material and drilling dust prior to installation of adhesive. Remove water from drilled holes in such a manner as to achieve a surface dry condition. Capsule anchors shall be installed with



equipment conforming to manufacturer recommendations. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

- L. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.

M. REPAIR OF DEFECTIVE WORK

1. Remove and replace misplaced or malfunctioning anchors at no additional cost to the City of New York. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.
2. Testing: 10% of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory provided under this work scope; Test shall be in accordance with manufacturer instructions for load testing. If more than 10% of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the herein, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.
3. Tension testing should be performed in accordance with ASTM E488.
4. Torque shall be applied with a calibrated torque wrench.
5. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed  $D/10$ , where D is the nominal anchor diameter.

- N. Minimum anchor embedments, proof loads and torques shall be as shown on the Drawings.

O. Manufacturers:

1. Hilti (basis of Design)
  - a. For Anchoring into solid Concrete: Provide adhesive anchor system similar to Hilti Injectable Mortar model # Hilti HIT-HY-200 (Accelerated). Utilize Hilti Anchor Rod, model Hilti HIT-Z,  $\frac{3}{8}$ " for pipe 2" and smaller,  $\frac{1}{2}$ " for pipe up to 3" and  $\frac{5}{8}$ " for pipe up to 4" and greater. Screw anchor is similar to KH-EZ or Kwik HUS-EZ
  - b. For Anchoring into Hollow Masonry: Provide adhesive anchor system similar to Hilti Injectable Mortar model # Hilti HIT-HY-70. When drilling into voids of existing hollow walls, provide adhesive composite screen model # Hilti HIT-SC with adhesive anchor system. Utilize Hilti Anchor Rod, model Hilti HAS,  $\frac{3}{8}$ " for pipe 2" and smaller,  $\frac{1}{2}$ " for pipe up to 3" and  $\frac{5}{8}$ " for pipe up to 4" and greater.
2. Powers
3. Redhead
4. Tapcon



- 5. Approved Equal

**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to General Conditions for execution requirements.

**3.2 INSTALLATION**

<b>Hanger Spacing Schedule</b>			
<b>Piping Material</b>	<b>Pipe Size</b>	<b>Maximum Hanger Spacing</b>	<b>Remarks</b>
Cast iron (hub and spigot)	All sizes	5 feet	Provide hanger behind each hub.
Cast Iron (hubless)	All sizes	5 feet	Provide hanger at each side of every joint.
Copper	1¼" and less	6 feet	
Copper	1½" and larger	10 feet	
Steel	All	10 feet	Provide hanger at each mechanical joint.
<p>Note: Restraint assemblies consisting of pipe clamps, rods and nuts shall be fitted to each hubless vertical to horizontal fitting. Sway bracing must be provided for above ground piping 6" or larger.</p>			

- A. For flat slab construction only, support hangers from concrete inserts. Furnish, locate and set such inserts and make sure that such inserts are in place when the concrete is poured. Construct inserts of malleable iron or pressed steel with space for rods of all sizes. Install all inserts for pipes 3" and larger in size with a reinforcing rod ½" in diameter run through a slot in the insert specifically provided for this purpose.
- B. For flat slab construction only, if any pipe is to be hung in a space where no inserts have been provided, drill holes in the slab and provide rods and hanger attached to an approved fishplate from which the hanger rod is to be suspended. For pipe size 2" and under, use single shields but the hanger spacing defined hereinbefore to be reduced to 5 feet. The carrying capacity and size of each shield to be calculated on the basis of the spacing indicated above but the minimum size to be ". Install additional shields of the same size so that the number of hangers are of adequate size to support the loads which they carry. Shields may be used in flat concrete slabs only.
- C. Regardless of the type of construction (i.e., concrete, concrete-deck-steel or other variations) take particular care to support all main lines and all large and heavy pipes in an approved manner, including the furnishing and installation of supplementary steel, if required. Supplementary steel sections are to be mill-rolled. Submit shop drawings, indicating support methods, point loadings to the building structure and hanger locations for



review sufficiently in advance of concrete pouring schedules to permit evaluation, critique and any necessary changes to handling and support methods.

- D. Set all inserts for all pipes in ample time to allow concrete work to be performed on scheduled time.
- E. Hangers may be directly attached to steel beams of building construction, where they occur, if approved by Commissioner. Smaller pipes may be suspended from crosspieces of pipe or steel angles, which in turn are to be securely fastened to building beams. The intention is to provide supports which, in each case, will be amply strong and rigid for the load, but which will not weaken or unduly stress the building construction.
- F. Provide approved roller support, floor stands, wall brackets, etc., for all lines running near the floor or near walls, which can be properly supported or suspended by the floors or walls. Pipelines near walls may also be hung by hangers carried from approved wall brackets at a level higher than the pipe.
- G. Do not hang piping from other piping. Support of hangers by means of vertical expansion bolts is not permitted.
- H. Support Locations for Vertical Piping
  - 1. Cast Iron Soil Piping: At every floor and at its base, but in no case greater than 20-foot intervals.
  - 2. Copper Tubing and Steel Pipe: At every floor but no more than 20-foot intervals.
- I. Hangers shall be installed outside of piping insulation with a semi-cylindrical galvanized shield set between the hanger and insulation.
- J. Trapeze hangers may be used instead of separate clevis hangers with suspension rods having double nuts and securely attached to the construction.
- K. All beam attachments shall be installed on clean, smooth, and non-fireproofed sections of the beam.
- L. All hangers, anchors, rods and supports shall be galvanized or painted. Comply with requirements in Section 099123 Painting for exterior painting

**END OF SECTION 22 05 29**



**Department of  
Design and  
Construction**

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**SECTION 22 05 33  
HEAT TRACING FOR PLUMBING PIPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
1. The Contract Drawings
  2. The Specifications
  3. The General Conditions
  4. The Addendum
  5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide electric heat tracing in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Provide complete Snow/Ground melt system for all locations indicated within the Contract Drawing.
1. Including sleeve and fire stopping for all wall penetrations, interior sleeves, conduit and hanger assemblies.

**1.4 SUBMITTAL PROCEDURE**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each type of product indicated.
1. Schedule heating capacity, length of cable, spacing, and electrical power requirement for each electric heating cable required.
- C. Shop Drawings: For electric heating cable. Include plans, sections, details, and attachments to other work.
1. Wiring Diagrams: Power, signal, and control wiring.
- D. Field quality-control test reports.



- E. Operation and Maintenance Data: For electric heating cables to include in operation and maintenance manuals.
- F. Warranty: Special warranty specified in this Section.

### **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 and marked for intended use.

### **1.6 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace electric heating cable that fails in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Furnish and Install a complete UL Listed, system of heating cables, components, and controls to snow and ice melt.
- B. Provide a complete system from a single manufacturer. The system shall be complete with all required cable, splice kits, tape, thermostat, power distribution/control panel with GFI protection, end seal kits, etc., as required for a complete installation. This contractor shall include the provisions for Including sleeve and fire stopping for all wall penetrations, interior sleeves, conduit and hanger assemblies. Conduit shall be installed in galvanized rigid metallic conduit (RMC) with rain tight compression couplings (bushings) at all transitions to the underground condition.
- C. Unless indicated otherwise on the drawings, the contractor is required to install the heat tracing cable lengths, circuit start point and end points, as appropriate for the circuit limitations and provide the correct number of circuits and properly sized control panel for the intended application.
- D. The installation shall comply with the manufacturer's instructions.
- E. Component enclosures shall be rated NEMA 4X to prevent water ingress and corrosion. Installation shall not require the installing contractor to cut into the heating-cable core to expose the bus wires. Connection systems that require the installing contractor to strip the bus wires or that use crimps or terminal blocks, shall not be acceptable. All components that make an electrical connection shall be reenterable for servicing. No component shall use silicone to seal the electrical connections. An exception will be made in areas where a conduit transition is required.



## 2.2 HEAT TRACING CABLE

- A. The self-regulating heating cable shall consist of two (2) 16 AWG nickel-copper bus wires embedded in parallel in a self-regulating polymer core that varies its power output to respond to temperature all along its length, allowing the heating cable to be cut to length in the field. The heating cable shall be covered by a radiation-crosslinked, modified polyolefin dielectric jacket. To provide a ground path and to enhance the heating cable's ruggedness, the heating cable shall have a braid of tinned copper and an outer jacket of fluoropolymer, as required per section 427-23 of the NEC-1996.
- B. In order to conserve energy and to prevent overheating, the heating cable shall have a self-regulating factor of at least 90 percent. The self-regulation factor is defined as the percentage reduction, without thermostatic control, of the heating cable output going from 40°F pipe temperature operation to 150°F pipe temperature operation.
- C. The heating cable shall operate on line voltages of 277 volts without the use of transformers.
- D. The heating cable for freeze protection shall be sized 8 watts per foot at 50°F. Piping 8" and larger shall have 2 strips of heat trace cable per foot.
- E. Power connection, end seal, splice, and tee kit components shall be applied in the field.
- F. Heating cable circuit shall be protected by a ground-fault device for equipment protection.

## 2.3 LABELING

- A. Warning Tape: Continuously printed "Electrical Tracing"; vinyl, at least 3 mils thick, and with pressure-sensitive, permanent, waterproof, self-adhesive back.
  - 1. Width for Markers on Pipes with OD, Including Insulation, Less Than 6 Inches: 3/4 inch minimum.
  - 2. Width for Markers on Pipes with OD, Including Insulation, 6 Inches or Larger: 1-1/2 inches minimum.

## 2.4 CONTROL PANEL

- A. The control equipment shall provide the required GFI protection for the heat tracing system. The system shall be modular for ease of expansion and shall provide complete system status and parameters locally, and remote alarm and data communication to the BMS.
- B. The system shall be field-mounted and shall have FM or CSA approval for Class I, Division 2, Groups A, B, C, D when using a solid-state switching device.
- C. The system shall provide the user with the option of line-sensing control with a user-selectable dead band, ambient sensing, proportional ambient sensing (PASC), and powerlimiting control modes.
- D. Enclosure type shall be NEMA 4X fiberglass reinforced plastic (FRP)
- E. Each heater cable shall be individually controlled by a Resistance Temperature Detector (RTD) device. The RTD shall be located on each pipe. The RTD shall be provided with armored lead wires to prevent damage.



Failure of a temperature sensor shall be indicated at the system monitor panel and shall result in activation of the heater cable. Mechanical thermostats shall not be used.

- F. The monitor system shall provide UL Listed GFI protection for all branch heater cable circuits per NEC 1996 Section 423-22. GFI shall have a 30 mA trip level. Monitor system shall provide High GFI Current warning at 20mA.
- G. Each heater cable including all tees shall be monitored and provide alarms for high and low current.
- H. The freeze protection control systems shall energize each heater cable independently when the pipe temperature drops to 40 degrees F. The system shall indicate an alarm condition when the pipe temperature drops to 35 degrees F.
- I. Each monitor channel shall have a separate microprocessor and alarm group. Each monitor panel shall be NEMA 4X, UL approved. The panel shall operate off of the heater cable power supply, at that voltage.
- J. Each monitor channel shall have autocycling capability for monitoring cable during the entire year. All setpoints and diagnostics shall be stored in non-volatile memory. Alarms shall be provided for memory and SCR failures.
- K. The control system shall provide as standard the following alarm outputs:
  - 1. Dry contact to BMS for common alarm (Low Pipe Temperature, Ground Fault Alarm/Trip, and Loss of Power).
  - 2. Units shall be network-ready to provide communication to a host computer running supervisor software for central programming, status review, and alarm annunciation. Units shall support communications protocols and be supplied complete with communications interface capability.

## **2.5 CONTROLS FOR DISTRIBUTED SYSTEMS**

- A. The control system shall be of distributed control design, comprised of a user interface display connected to smart contactors located as indicated on the drawings and as associated with the specified heating cable applications.
- B. The distributed system shall provide for independent control functions at each smart contactor allowing for maximum system reliability and redundancy.
- C. The user interface shall allow parameters and algorithms to be selected for any or all of the following applications. Refer to contract drawings for indication:
  - 1. Freeze Protection:
    - a. Each heater cable shall be individually controlled by a line temperature sensing device. The RTD shall be located on each pipe as indicated on the contract drawings. The RTD shall be provided with armored lead wires to prevent damage. Failure of a temperature sensor shall be indicated at the system monitor panel and shall result in activation of the heater cable. Mechanical thermostats shall not be used.



- b. The control system shall energize each heater cable independently when the pipe temperature drops to 40 degrees F. The system shall indicate an alarm condition when the pipe temperature drops to 35 degrees F.
- D. The system shall be field-mounted and shall have FM or CSA approval for Class I, Division 2, Groups A, B, C, D when using a solid-state switching device.
- E. The system shall provide the user with the option of line-sensing control with a user-selectable dead band, ambient sensing, proportional ambient sensing (PASC), and power limiting control modes.
- F. Enclosure type shall be NEMA 4X fiberglass reinforced plastic (FRP) stainless steel for corrosion resistance and protection from moisture.
- G. The monitor system shall provide UL Listed GFI protection for all branch heater cable circuits per NEC 1996 Section 423-22. GFI shall have a 30 mA trip level. Monitor system shall provide High GFI Current warning at 20 mA.
- H. Each heater cable including all tees shall be monitored and provide alarms for high and low current.
- I. The system shall have autocyling capability for monitoring cable during the entire year. All setpoints and diagnostics shall be stored in non-volatile memory. Alarms shall be provided for memory and SCR failures.
- J. The system shall provide ground-fault monitoring, trip alarm and fault protection for every heat-tracing circuit and fulfills the requirements of National Electrical Code.
- K. The user interface terminal shall be a LCD color display with touch screen technology. The UIT shall display and allow programming of all settings and be password protected to prevent unauthorized access to the system. The system shall be capable of controlling all heating applications independently by circuit.
- L. The control system shall be capable of setting different temperatures based on user defined input with 24 hour, 7 day/week programmable options.
- M. The control system shall have a user selectable option to save energy by lowering floor temperature during low use periods.
- N. The control system shall provide as standard the following alarm outputs:
  - 1. Dry contact to BMS for common alarm (Low Pipe Temperature, Ground Fault Alarm/Trip, and Loss of Power).
  - 2. Units shall be network-ready to provide communication to a host computer running with supervisor software for central programming, status review, and alarm annunciation. Control panel units shall support a communications protocol and be supplied complete with RS-485 communications interface capability.
    - a. The controller shall provide the following alarms: high/low temperature or RTD failure, high ground-fault current, ground-fault trip, high/low current fault, circuit relay failure, communication failure and loss of power.



## **2.6 MANUFACTURERS**

### **A. Heat Tracing:**

1. Raychem Corporation (basis of design)
  - a. Cable: XL-Trace cable
  - b. Control Panel System: DigiTrace Control Panel
2. Nelson
3. Thermon
4. Approved equal

### **B. Communication Signal:**

1. Modbus
2. ASCII/HTC Bus
3. LonWorks
4. Approved Equal

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 EXAMINATION**

- A. Examine surfaces and substrates to receive electric heating cables for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Ensure surfaces and pipes in contact with electric heating cables are free of burrs and sharp protrusions.
  2. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.3 INSTALLATION**

- A. Install electric heating cable across expansion, construction, and control joints according to manufacturer's written recommendations using cable protection conduit and slack cable to allow movement without damage to cable.
- B. Install electric heating cables after piping has been tested and before insulation is installed.



- C. Install electric heating cables according to IEEE 515.1.
- D. Install insulation over piping with electric cables according to Section 220719 "Plumbing Insulation."
- E. Install warning tape on piping insulation where piping is equipped with electric heating cables.
- F. Set field-adjustable switches and circuit-breaker trip ranges.
- G. Protect installed heating cables, including nonheating leads, from damage.

### **3.4 FIELD QUALITY CONTROL**

- A. Testing: Perform tests after cable installation but before application of coverings such as insulation, wall or ceiling construction, or concrete.
  - 1. Test cables for electrical continuity and insulation integrity according to manufacturer's instructions before energizing.
  - 2. Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.
- B. Repeat tests for continuity, insulation resistance, and input power after applying thermal insulation on pipe-mounting cables.
- C. Remove and replace malfunctioning units and retest as specified above.

### **3.5 BURIED PIPING**

- A. Buried splices or terminations will not be permitted. All splices or terminations in buried piping shall be extended above grade for access. Additional cable length required to accommodate the above grade splices shall be included.

### **3.6 TEMPERATURE SENSORS (RTD)**

- A. Install temperature sensors at furthest installed underground wire within the system.

### **3.7 AMBIENT TEMPERATURE SENSORS**

- A. For all freeze protection systems provide an ambient temperature sensor to shut off the freeze protection system when the ambient temperature exceeds 50°F.

**END OF SECTION 22 05 33**



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**SECTION 22 05 53  
IDENTIFICATION OF PLUMBING PIPING AND EQUIPMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide information of plumbing systems in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Pipe Labeling
- B. Valve and Equipment Tagging

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Provide the following Manufacturer's Specifications and Engineering Data:
  - 1. Materials
  - 2. Parts
  - 3. Devices
  - 4. Finish
  - 5. Area of Use



## **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Current edition of the New York City Plumbing Code (2014)
- C. Plumbing and Drainage Institute (PDI).
- D. ANSI.
- E. National Sanitary Foundation (NSF).
- F. ASTM.
- G. Underwriters Laboratories (UL).

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. The following specifications represent desired design, material, and construction standards for the various items of work. Manufacturer names and model numbers are used to describe specific types, styles and quality.

### **2.2 PIPE LABELING**

- A. All piping shall be identified by stenciled lettering, or self-adhesive pipe markers which legend conforms to OSHA/ANSI standards including but not limited to the identification of flow direction, pressure, supply/return, pump discharge, cold water, hot water, hot water return, etc.
- B. There shall be at least one lettering identification for each pipe in each space and at all valve locations.
- C. For painted identification use color sharply contrasting with background. If necessary, paint a strip background of black or white to obtain contrast.
- D. Vertical piping shall be labeled at each floor. Horizontal piping shall be labeled every 10', both sides of partitions, before and after turns, and close to valves and flanges.
- E. Each set consisting of one (1) band on which the name of the service is printed in black letters not less than 1½ inches high, and one (1) band on which is printed a black directional arrow. Apply bands where they can be easily read and with their long dimension parallel to the axis of the pipe. Provide bands with backgrounds of different colors from the various service groups.
- F. Adhesive Bands: provide pipe markings that meet ANSI (ASME) A13.1-2015 pipe marking guidelines, self-adhesive vinyl—to apply, peel and stick in place, temperature range is -40°F to 180° F, for use with dry and clean indoor pipes.



### **2.3 VALVE AND EQUIPMENT TAGGING**

- A. Tag valves with identifying number and system. Number valves by floor level.
- B. For valves, etc., use metal tags 2" minimum in diameter with 1" painted letters fabricated of brass, stainless steel or aluminum. Attach tags with chain of same material.
- C. Prepare lists of all tagged valves showing location, floor level, tag number and use. Prepare separate lists for each system. Mount lists under a sheet of clear acrylic in Equipment Room. Include copies in each maintenance manual.
- D. Provide charts showing equipment lubrication points, lubrication required and frequency, and columns for date and initials.
- E. Stencil equipment with identifying letters and numbers as used on drawings. Where space is available use full name of equipment.
- F. Identify all controls such as motor starters not in motor control centers, float switches and alarms.

### **2.4 MANUFACTURERS**

- A. Pipe Labels
  - 1. W.H. Brady
  - 2. Seton
  - 3. Brimar Industries, Inc.
  - 4. Kolbi Pipe Markers Co.
  - 5. Approved equal.
- B. Valve Tags
  - 1. W.H. Brady
  - 2. Seton
  - 3. Brimar Industries, Inc.
  - 4. Kolbi Pipe Markers Co.
  - 5. Approved equal.



**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**END OF SECTION 22 05 53**



**SECTION 22 05 90  
TESTING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide testing for all plumbing systems in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Testing requirements of all new systems.

**1.4 SUBMITTALS PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Provide all test certifications.
- C. Approvals.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. AWWA
- C. New York City Building Code (2014)
- D. NFPA-54
- E. Utility Requirements



## **PART 2 - PRODUCTS**

### **2.1 NOT USED.**

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.
- B. In addition to any inspections otherwise required by the NYC plumbing code or applicable rules, the holder of the permit shall be responsible for scheduling and satisfactorily completing all required progress inspections as noted within the current edition of the NYC Plumbing Code, including but not limited to underground inspections, rough-in, special inspections and inspections required by the New York City Energy Conservation Code.

### **3.2 DOMESTIC WATER SYSTEM**

- A. The domestic water system shall be tested in accordance with the NYC Plumbing Code requirements, as outlined within the current edition of the NYC plumbing code. Further, upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure of 50 psi above its normal working pressure but not less than 150 psi. The water utilized for tests shall be obtained from only a potable source of supply.

### **3.3 SOIL, WASTE, SANITARY VENT AND STORM WATER SYSTEMS**

- A. Except for outside leaders and perforated or open jointed drain tile (subsoil drains), the piping of sanitary and storm drainage and vent systems shall be verified as to materials and shall be tested upon completion of the rough piping installation and prove to be water tight. The removal of cleanout plugs may be required to ascertain that the prescribed pressure has been reached in all parts of the system. Testing of sections shall be done in order to permit general construction and other work to proceed. Such tests shall be made in the presence of a Building Department Inspector.
- B. Water Test. A water test shall be applied to the drainage system either in its entirety or in sections after rough piping has been installed. If applied to the entire system, all openings in the piping, except the highest opening, shall be tightly closed and the system filled with water to the point of overflow. If the system is tested in sections, each opening, except the highest opening of the section under test, shall be tightly plugged and each section filled with water. No section shall be tested with less than a ten foot head of water. In testing successive sections, at least the upper ten feet of the following section shall be tested, so that no joint or pipe in the building (except the uppermost ten feet of the system) shall have been submitted to a test of less than ten foot head of water. The water shall be kept in the system or in the portion under test for at least four (4) hours before inspection starts; the system shall then be tight at all points.
- C. Air Test. An air test may be used only when permission for this type of test is obtained from the Commissioner. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening and, after closing all other inlets and outlets of the system, forcing air into the system until there is a



uniform gauge pressure of five psi or sufficient pressure to balance a column of mercury ten inches in height. This pressure shall be held, without introducing additional air, for a period of at least thirty minutes.

**D. Buried Piping**

1. In addition to the hydrostatic testing indicated above all buried piping shall be videotaped, prior to the installation of any new piping.

**3.4 NATURAL GAS SYSTEMS**

**A.** Upon completion of a section of a gas system or of the entire gas system and before appliances are connected thereto, the completed section or system shall be verified as to materials, and tested and proven tight as described hereafter.

**B. Gas Distributing Piping**

1. All gas piping shall comply with the testing requirements of National Grid and the NYC Fuel Gas Code.
2. In addition, piping shall be tested in accordance with the following criteria:

Operating Pressure	Test Pressure	Duration
Less than ½ psig	3 psig	1 hour
½ psig to 3 psig	50 psig	1 hour
3 psig to 15 psig	100 psig	1 hour
15 psig and above	100 psi or 2 times operating pressure whichever is greater	2 hour

**C. Meter Piping**

1. Meter piping shall be pressure tested in accordance with the requirements of the serving utility. These requirements shall be either the same as those for testing distribution piping or if different, the piping shall be certified by the local utility as being tested in compliance with their requirements.
2. Notwithstanding the above, all coated or wrapped pipe shall be pressure tested at a minimum of ninety psig.



**D. Testing Procedure**

1. For testing, the piping shall be filled with air or an inert gas, and the source of pressure shall be isolated before the pressure readings are made. All test duration time periods are to be measured after stabilization of testing medium.

**END OF SECTION 22 05 90**



**SECTION 22 07 19  
INSULATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 SUMMARY**

- A. Provide insulation in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Equipment Insulation.
- B. Piping Insulation.

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit insulation shop drawings for each service.
- C. Product Data: Manufacturer's latest published data for materials, equipment and installation.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. ASTM C335.
- C. ASTM C356.



- D. ASTM C411.
- E. ASTM C547.
- F. ASTM 84.
- G. ASTM 225.
- H. U.L.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Conform to application schedule specified herein for types and thicknesses of insulation.
- B. Provide insulation (including insulation jacket or facing and adhesives used to adhere the facing or jacket to the insulation) with noncombustible material meeting all fire and smoke hazard ratings as tested by procedure ASTM E-84, National Fire Protection Association 225, and UL 723, not exceeding flame spread 25 and smoke developed 50.

### **2.2 PIPE INSULATION**

- A. Materials
  - 1. Fiberglass Density: All Fiberglass pipe insulation in equipment rooms and/or where exposed, to be of the sectional type having 6 lbs./cu. ft. density. All other fiberglass insulation to be of the 1-piece type having 4 lb. density.
  - 2. Thermal conductivity of fiberglass to be 0.23 BTU/hr/inch/sq. ft./°F at a mean temperature of 75°F.
  - 3. Thermal conductivity of calcium silicate to be 0.32 BTU/hr/inch/sq. ft./°F at a mean temperature of 100°F.
- B. Insulation Jackets
  - 1. Hot Pipes Concealed: Factory applied white fire-retardant jacket, (ASJ), taped and banded. Pipes banded with not less than 3 bands per section.
  - 2. Hot Pipes Exposed: Factory applied white fire-retardant jacket, (ASJ), with butt strips taped and banded. Pipes banded with not less than 3 bands per section.
  - 3. Cold Pipes Concealed and Exposed: Factory applied white fire-retardant jacket with self-sealing lap (ASJ) and butt strip. Ends of pipe insulation sealed off at valves, fittings and flanges with I.C. 301 or FB 30-35).



4. Finish calcium silicate with glass cloth adhered with I.C. 501 or BF 30-36.
5. Vapor jacket permeability to be 0.02 perms.
6. Jacket Puncture Resistance to be 50 units (Beach).
7. Piping Exposed to Outdoors: Cover piping and fittings which is exposed to weather or called for to be weatherproof, in addition to insulation and finishes specified for piping exposed to outdoors, with a polished aluminum jacket.

C. Application Schedules

1. Schedule

Service	Material	Insulation Thickness in Inches for Pipe Sizes					
		1" and less	1¼" to less than 1½"	1½" to 2"	2½" to 4"	5" to 6"	8" and larger
Horizontal Storm Drains and Drain Bodies	Glass Fiber	---	1"	1"	1"	1"	1"
Domestic Cold Water	Glass Fiber	1"	1"	1"	1"	1"	1"
Drains and Drain Bodies Receiving Condensate	Glass Fiber	--	1"	1"	1"	1"	--
Drain Traps at Handicapped Sinks	Glass Fiber	--	1/2"	1/2"	--	--	--
Domestic Hot Water and Hot Water Return System (105° F– 140° F)	Glass Fiber	1"	1"	1.5"	1.5"	1.5"	1.5"

2. Piping Exposed to Outdoors and Pipes Subject to Freezing: Cover any piping subject to freezing with an additional layer of 2" glass fiber insulation of the same finish as specified for the particular service when not subject to freezing, but not less than 3" total thickness.
3. For heat-traced piping, insulation must be sized to accommodate electric cable. Cover with an aluminum jacket, as specified for piping exposed to the weather.



**D. Fittings, Valves and Flanges**

1. Where manufactured, use factory premolded fittings (of the same material and thickness as the pipe insulation) for all fittings, flanges and valves.
2. Where premolded insulation fittings are not manufactured, insulate all fittings, flanges and valves with mitered segments of the same density as the adjoining pipe covering. Finish hot service applications with open weave glass mesh adhered with I.C. 501 (or BF 30-35). For cold applications with I.C. 501 (or BF 30-35) adhesive with open weave glass mesh laid in while wet with final coat with I.C. 501 (or BF 30-35) adhesive. Overlap glass mesh and outer coat adjacent covering by at least 2". Do not insulate flanges until systems are operational.
3. Provide insulation for removable flanges of pipe strainers on cold services with built-up sections of glass fiber pipe covering, arranged to facilitate servicing of the strainer. Complete applications with vaporseals. All vapor barriers to be sealed and continuous through hangers, walls, sleeves, etc. All adhesives and coatings to be as noted herein.
4. Insulate fittings, flanges, valves, etc. for services where calcium silicate insulation is specified as a pipe insulation with mineral wool cement of equal thickness to the pipe insulation and finished with glass cloth.
5. Provide PVC Roll Jacketing in standard thicknesses of 10 mil and in standard widths of 35½ and 48 inches. Roll jacketing shall be made from high impact UV-resistant (white only) polyvinyl chloride material designed to provide an inherent vapor retarder and protection to insulated pipes.
6. Insulate water supply lines inside chases and up to the plumbing fixture supply stop.

**2.3 MANUFACTURERS**

**A. Insulation**

1. Owings Corning Fiberglas
2. Johns Manville
3. Certain-Teed
4. Pittsburgh Corning
5. Approved equal



- B. Adhesives and Sealers
  - 1. Benjamin Foster (B-F)
  - 2. Insul-Coustic (I-C)
  - 3. Minnesota Mining and Mfg. Co. (3M)
  - 4. Approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 INSTALLATION OF INSULATION**

- A. Perform all work in strict accordance with the manufacturer's recommendation and the best practice of the trade and the intent of this specification.
- B. Apply all insulation over clean dry surface, butting all sections or surfaces firmly together and finishing as hereinafter specified.
- C. Seal all vapor barriers continuous and throughout against moisture penetration.

#### **3.3 PROTECTION OF INSULATION**

- A. Protect pipe insulation at hangers, guides, and rollers by 16 gauge galvanized metal shields (at least 3 times the insulation diameter in length and 1/3 the insulation circumference in width) on the outside of the insulation and vapor barrier. Hold shields in place by straps. Do not pierce the insulation with hangers. Where glass fiber insulation is used on piping 3" and larger, provide half-section of calcium silicate covering of equal thickness at metal shields.
- B. Do not use staples.

**END OF SECTION 22 07 19**



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**SECTION 22 08 00  
COMMISSIONING OF PLUMBING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract]

**1.2 SUMMARY**

- A. This section includes commissioning process requirements for Plumbing systems, assemblies, and equipment.
- B. Related Sections:
  - 1. DDC General Conditions Section for general commissioning process requirements.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions "Submittal Procedures" for all submittals.

**1.4 DESCRIPTION**

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the installing contractors to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

**1.5 DEFINITIONS**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for definitions.

**1.6 SUBMITTALS**

- A. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment



specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

- B. The CxA will receive a copy of the final approved submittals.
- C. In addition, the contractor is to provide the following:
  - 1. Certificate of readiness
  - 2. Certificates of completion of installation, prestart, and startup activities.
  - 3. O&M manuals
  - 4. Test reports
- D. Refer to DDC General Conditions for general commissioning submittal requirements.
- E. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

#### **1.7 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Test Equipment Calibration Requirements: Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

#### **1.8 COORDINATION**

- A. Commissioning Kick-Off Meeting – Construction Team: Contractors will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.
- B. Commissioning Meetings: Contractors will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.
- C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA shall be provided with the subsequent meeting minutes for review.
- D. Pre-testing Meetings: Contractors will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and



instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.

- E. Testing: Contractors will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: Contractors will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: Contractors will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT**

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor 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 contractor.
- B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 GENERAL DOCUMENTATION REQUIREMENTS**

- A. With assistance from the Contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractors for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits.



- B. Red-lined Drawings (As-Built): Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The 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 Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

### **3.3 CONTRACTOR'S RESPONSIBILITIES**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for general contractor's responsibilities.
- 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, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for owner. Distribute preliminary schedule to commissioning team members. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.
- G. Provide detailed startup procedures.
- H. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications
- I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- J. Respond to provided new deficiencies and/or responses within five (5) business days.



- K. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the specifications. Submit to CxA 45 days after submittal acceptance.
- L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- M. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.
- N. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.
  - 1. Secondary storm water drainage piping walkthrough
  - 2. Emergency drainage system piping walkthrough
  - 3. Static Pressure Testing as required
- 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 Commissioner for review and acceptance.
  - 3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.
  - 4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R contractor and the Contractor.
  - 5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
  - 6. Provide recommended setpoints as determined by Testing, Adjusting, and Balancing such as static pressure and differential pressure setpoints.
- R. Equipment Suppliers
  - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.



2. Assist in equipment testing per agreements with Contractors.
3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

### **3.4 CxA'S RESPONSIBILITIES**

#### **A. Roles and Responsibilities**

1. Refer to DDC General Conditions Section "General Commissioning Requirements" for general CxA responsibilities.

#### **B. Cx Team Meetings**

1. Commissioning during the Construction Phase will begin with a 'Commissioning Kick-Off Meeting – for Construction Team' conducted by the CxA where the commissioning process is reviewed with all of the commissioning team members.
2. Additional meetings will be required throughout the Construction and Acceptance phases. The CxA shall attend select meetings related to commissioning as required by the DDC during the Construction and Acceptances phases.

#### **C. Coordination and Scheduling**

1. Coordinate and direct commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications, and consultations with all necessary parties.
2. Coordinate commissioning work with the Resident Engineer to ensure that commissioning activities are being scheduled into the master project schedule.
3. Coordinate with the Resident Engineer to witness tests, inspections, and systems startup.

#### **D. Commissioning Progress**

1. Perform periodic site visits to observe component and system installations, and qualify contractor completed checklists.
2. Report deficiencies to the Commissioner including but not limited to issues related to adequate accessibility required for component maintenance replacement and repair.
3. Review construction meeting minutes for revisions/substitutions relating to the commissioning process.

#### **E. Pre-Functional Checks**

1. Verify proper installation of components, equipment, systems and assemblies. Sampling procedures may not be employed on systems and equipment.



2. Pre-Functional checks for a piece of equipment shall only be started once the approved checklist for a piece of equipment has been received from the installing contractor indicating the equipment is ready to begin its pre-functional checks.
3. Team will not be allowed to move forward into functional testing until all Pre-Functional testing is completed and the team moves onto the Acceptance Phase for the project.

**F. Equipment and System Startup and Verification**

1. Review and approve component, equipment, system, and assembly startup plan developed and submitted by the Contractor.
2. Approve system startup by reviewing startup reports, if contracted; and by selected site observation.
3. Review the Testing, Adjusting and Balancing execution plan for the project, which shall be submitted by the TAB subcontractor.
4. Verify and document the accuracy of the air and water systems balancing by spot testing the air and water reported field values with TAB subcontractors and by reviewing completed reports.

**G. Functional Performance Testing**

1. With assistance from the Contractor, write Functional Performance Testing procedures for all components, equipment or systems to be commissioned.
2. With the assistance of the Contractors, coordinate Functional Performance Testing. Witness and approve Functional Performance Testing performed by the Contractors.
3. With the assistance of the Contractors, coordinate retesting as necessary until satisfactory performance is achieved.
4. Witness seasonal or deferred Functional Performance Testing as necessary.

**H. Issue/Deficiency Logs**

1. The CxA shall prepare a formal, ongoing, online record of deficiencies, problems and concerns – and their resolution – raised by members of the Commissioning Team during the Commissioning Process.
2. Issues will be recorded on an online Commissioning Issues Log for the contractors to resolve to the satisfaction of the Commissioner. Issues will be added by the CxA. Team members are required to post their own responses to issues pertaining to their work. Team members are required to respond to issues added to the list within five (5) working days of being added by the CxA.
3. Issues will be revisited one (1) time to verify that the proper corrections have been made.
4. When issues are resolved, they will be closed on the Issues Log by the CxA.

**I. Operation and Maintenance Data**



1. The CxA shall review of the documentation submitted by the Contractor as required by the Specifications for completeness and accuracy. This commissioning review supplements, but does not replace, the Commissioner's review.
2. Review equipment warranties.

**J. Instruction**

1. The Contractor will provide all documentation and qualified instruction personnel for instruction.
2. The CxA will verify through the Contractor's plan and schedule, instruction agendas, and select observations that proper instruction procedures were followed on all commissioned systems.
3. The CxA will verify that Instruction Video Recordings are executed, collected, and provided to the Commissioner and/or appropriate New York City Personnel.
4. See appropriate section below pertaining to instruction.

**K. Systems Manual Requirements**

1. Index of Systems Manual with notation as to content storage location if not in actual manual.
2. Executive Summary
3. A list of recommended operational record keeping procedures at the facility level, including sample forms, trend logs, or others, and a rationale for each.
4. Maintenance procedures, schedules and recommendations.
5. Ongoing Optimization
6. Other Attachments

**L. Post Occupancy Review**

1. The CxA will return to the site within the 12-month warranty period to address the following: review current building operations with facility staff and address outstanding issues related to the Owner's Project Requirements; Interview facility staff and identify problems or concerns with operating the building; Identify problems covered under warranty or under the original construction contract.
2. The CxA will make suggestions for improvements in the content of the O&M Manuals. Any required changes shall be made by the contractor responsible for that section.
3. The CxA shall assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

**M. Commissioning Final Report**



1. The CxA shall provide a final report following the completion of all Functional Performance Testing. The report is to outline compliance and non-compliance to the construction documents, as well as identify concerns relative to future performance

### **3.5 TESTING PREPARATION**

- A. Certify in writing to the CxA that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing to the CxA that Plumbing instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.
- C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

### **3.6 TESTING, ADJUSTING AND BALANCING VERIFICATION**

- A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.
- B. Notify the CxA at least ten (10) days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
  1. The CxA will notify 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.

### **3.7 GENERAL TESTING REQUIREMENTS**

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of Plumbing testing shall include entire Plumbing installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA along with the Plumbing contractor, testing and 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. 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.
- C. **Plumbing Distribution System Testing:** Provide technicians, instrumentation, tools, and equipment to test performance of air, fuel gas, sanitary waste and vent piping, storm drainage piping, sprinkler and domestic water distribution systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.
- D. **Vibration and Sound Tests:** Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- E. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
1. Secondary storm water drainage piping walkthrough
  2. Emergency drainage system piping walkthrough
  3. Static Pressure Testing as required

### **3.9 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT**

- A. **Deficiencies/Non-Conformance**
1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and Contractors on a standardized form.
  2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the contract document in dispute or request further information to clarify the concern.
  3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
  4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
  5. As tests progress and a deficiency is identified, the CxA discusses the issue with the executing Contractor.



6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function
7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.
8. Deficiencies that are not corrected at the time of documentation, shall be completed by the affected contractor and photo evidence of the deficiency resolution shall be sent to both the Commissioner and the CxA.

**B. Failure due to Manufacturer Defect**

1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Contractor, CxA or Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
  - a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
  - b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
  - c. The Contractor, CxA, or Commissioner will determine whether a replacement of all identical units or a repair is acceptable.
  - d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the CxA or Commissioner will decide whether to accept the solution.
  - e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.



**3.10 APPROVAL**

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

**3.11 DEFERRED TESTING**

- A. Unforeseen Deferred Testing – If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Commissioner. These tests will be conducted in the same manner as the seasonal tests, as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system’s design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate Contractors, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

**3.12 OPERATION AND MAINTENANCE MANUALS**

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in DDC General Conditions.
- B. The specific content and format requirements for the standard O&M manuals are detailed in DDC General Conditions. Special requirements for the controls Contractor and TAB Contractor are found in Division 23.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

**3.13 INSTRUCTION OF CITY OF NEW YORK PERSONNEL**

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York’s personnel for commissioned equipment and systems.
  - 1. The CxA shall interview the City of New York’s staff to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor. Who will in turn communicate to the subcontractors and vendors who also have instruction responsibilities.



2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by contractors, subcontractors and vendors are specified in the individual sections listed in Section 1.2 – Summary.
3. Each Sub and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
  - a. Equipment (included in instruction)
  - b. Intended audience
  - c. Location of instruction
  - d. Objectives
  - e. Subjects covered (description, duration of discussion, special methods, etc.)
  - f. Duration of instruction on each subject
  - g. Qualified instructor for each subject
  - h. Instructor qualifications
  - i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary equipment, the Controls Subcontractor shall provide a discussion of the control of the equipment during the instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
  - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
  - b. Copy of the Owner's Project Requirements.
  - c. Copy of the Basis of Design.
  - d. Compiled operations manuals.
  - e. Compiled maintenance manuals.
  - f. Completed manufacturer instruction manuals.



- g. Red-lined drawings.
  - h. Other pertinent documents.
7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending some of the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
  8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment
  9. Videotaping of the instruction sessions in DVD format will be provided by the CxA.

**END OF SECTION 22 08 00**



**Department of  
Design and  
Construction**

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**SECTION 22 14 13  
STORM DRAIN PIPING AND FITTING MATERIALS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 DESCRIPTION**

- A. Provide piping and fitting materials in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Piping.
- B. Fittings.
- C. Related Accessories.

**1.4 SUBMITTALS PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit a list of all proposed piping materials including system/material (use schedule).
- C. Submit complete back-up material where proposed materials differ from those specified.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Each pipe length shall have the manufacturer's name cast, stamped or rolled on.
- C. Each fitting shall have the manufacturer's name cast, stamped or rolled on.



- D. The following are references to the specifications standards of recognized authorities to which pipe and fitting materials must conform to be acceptable. All references shall be the latest edition in force at the time of bidding.

<b>Material</b>	<b>Authority Spec. Numbers</b>
Sleeve Pipe, Black and Galvanized	ANSI B36.20
Steel Pipe, Black and Galvanized	ANSI B36.20
Extra Heavy and Service Weight Cast Iron Soil Pipe and Fittings	CS188-66
Caulking Lead, Type I	FS-QQ-L156(1)
Neoprene or Rubber Gasket, Compression	CISPI HSN-75
Hubless Cast Iron Soil Pipe and Fittings	CISPI 301
Cast Iron Threaded Drainage Fittings	ANSI B16.12

## **PART 2 - PRODUCTS**

### **2.1 CAST IRON SOIL PIPE (XH)**

- A. Pipe: Uncoated extra heavy cast gray iron, hub and spigot type with weight per foot and maker's name clearly stamped or cast on each length.
- B. Fittings: Hub and spigot, extra heavy cast iron.
- C. Joints: Lead and oakum caulked.
- D. Application: Underground storm piping inside and outside of building to point of connection with municipal sewers.
- E. Manufacturer
  - 1. Tyler
  - 2. Charlotte
  - 3. AB&I Foundry
  - 4. U.S. Pipe
  - 5. Approved Equal



**2.2 CAST IRON SOIL PIPE (SV)**

- A. Pipe: Service weight centrifugally spun cast iron soil pipe hub and spigot type with weight per foot and maker's name clearly stamped or cast on each length.
- B. Fittings: Hub and spigot service weight cast iron.
- C. Joints: Oakum and lead, Neoprene or rubber gasket, compression.
- D. Application:
  - 1. All storm water except as noted under Hubless Cast Iron.
- E. Manufacturer
  - 1. Tyler
  - 2. Charlotte
  - 3. AB&I Foundry
  - 4. U.S. Pipe
  - 5. Approved Equal

**2.3 CAST IRON SOIL PIPE (HUBLESS)**

- A. Pipe: Hubless cast iron soil pipe coated inside and out.
- B. Fittings: Hubless service weight, cast iron.
- C. Joints: Neoprene gasket and heavy-duty type 304 stainless steel shield and four stainless steel bands for sizes 1½" through 4", six bands minimum for sizes 5" and larger.
- D. Application:
  - 1. Branch storm piping from drain to connections to stack.
- E. Manufacturer
  - 1. Tyler
  - 2. Charlotte
  - 3. AB&I Foundry
  - 4. U.S. Pipe



5. Approved Equal

## **2.4 GALVANIZED STEEL PIPE**

- A. Pipe: Galvanized steel pipe, Schedule 40 with maker's name rolled into each length.
- B. Fittings
  1. Threaded: Galvanized malleable iron with flat band steam pattern. Cast iron drainage pattern for waste piping.
- C. Application
  1. Schedule 40 steel for sump pump discharges.
  2. Schedule 40 steel for storm drainage greater than 15".
- D. Manufacturer
  1. Tyler
  2. Charlotte
  3. AB&I Foundry
  4. U.S. Pipe
  5. Approved Equal.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 JOINTS**

- A. Caulked Joints: Firmly pack joints with an oakum gasket and seal with molten virgin pig lead. Use twelve ounces of molten lead for each inch in diameter of pipe used at each joint. Run lead in one pouring and caulk tight. Seal and smoothly face the joints.
- B. Threaded Joints: Do not damage fitting surface, remove burrs and ream smooth. Apply Teflon tape to male threads only. Clean joint thoroughly of excess jointing material.
- C. Flanged Joints: Use matched flange faces and 1/16" thick compressed gaskets.



- D. Compression Joints: Lubricate neoprene gasket and slip into hub end of pipe. Draw spigot end of pipe into the gasketed hub. Provide restrained joints at all changes in pipe sizes, at all changes in direction of run and at all dead ends.
- E. Mechanical (Grooved) Joints: Joints shall be made with neoprene or synthetic rubber gaskets.
- F. Make joints between different piping materials with adaptor fittings of a type suitable for the purpose intended.
- G. Make joints between pipes of dissimilar metals with dielectric union or flanges.
- H. Graphite shall be used on all cleanout plugs or caps.
- I. All mechanical joint fittings and couplings shall be made by the same manufacturer.

### **3.3 BRACING**

- A. Hubless cast iron pipe shall have bracing installed as required by CISPI and the manufacturer.

### **3.4 INSTALLATION**

- A. All materials shall be new and installed in a first-class manner.
- B. All drainage piping, unless otherwise indicated, shall be pitched at a minimum rate of 1/8 inch per foot in direction of flow. Branch connections to stacks or main drains shall not be made in a manner which will permit backflow.
- C. Nipples: Any piece of pipe 8 inches in length and less shall be considered a nipple. All nipples shall be of weight corresponding to fitting connected. Only shoulder nipples shall be used unless otherwise directed.

### **3.5 OPERATING INSTRUCTIONS PERIOD**

- A. Provide one day of instructions.

### **3.6 SOIL, WASTE, VENT AND STORM WATER SYSTEMS**

- A. Except for outside leaders and perforated or open jointed drain tile (subsoil drains), the piping of sanitary and storm drainage and vent systems shall be verified as to materials and shall be tested upon completion of the rough piping installation and prove to be water tight. The removal of cleanout plugs may be required to ascertain that the prescribed pressure has been reached in all parts of the system. Testing of sections shall be done in order to permit general construction and other work to proceed. Such tests shall be made in the presence of the Building Department Inspectors.



- B. **Water Test.** A water test shall be applied to the drainage system either in its entirety or in sections after rough piping has been installed. If applied to the entire system, all openings in the piping, except the highest opening, shall be tightly closed and the system filled with water to the point of overflow. If the system is tested in sections, each opening, except the highest opening of the section under test, shall be tightly plugged and each section filled with water. No section shall be tested with less than a ten-foot head of water. In testing successive sections, at least the upper ten feet of the following section shall be tested, so that no joint or pipe in the building (except the uppermost ten feet of the system) shall have been submitted to a test of less than ten foot head of water. The water shall be kept in the system or in the portion under test for at least four (4) hours before inspection starts; the system shall then be tight at all points.
- C. **Air Test.** An air test may be used only when permission for this type of test is obtained from the Commissioner. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening and, after closing all other inlets and outlets of the system, forcing air into the system until there is a uniform gauge pressure of five psi or sufficient pressure to balance a column of mercury ten inches in height. This pressure shall be held, without introducing additional air, for a period of at least thirty minutes.
- D. **Buried Piping**
1. In addition to the hydrostatic testing indicated above all buried piping shall be videotaped twice. Once after backfilling is complete and a second time after the slabs have been poured. A report and videotape shall be given to the Commissioner after each test.

**END OF SECTION 22 14 13**



**SECTION 22 14 23  
STORM DRAINAGE SPECIALTIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project:
  - 1. The Contract Drawings
  - 2. The Specifications
  - 3. The General Conditions
  - 4. The Addendum
  - 5. The Contract (City of New York Standard Construction Contract)

**1.2 DESCRIPTION**

- A. Provide sanitary and storm drainage work scope systems in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Traps
- B. Cleanouts
- C. Drains
- D. Downspout Nozzle

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Manufacturer's Data Sheet.



## 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Applicable Standards
  - 1. Current edition of the NYC Plumbing Code (2014)
  - 2. PDI, Plumbing Drainage Institute

## PART 2 - PRODUCTS

### 2.1 TRAPS

- A. All traps for showers and drains shall be brass or cast iron (threaded or caulked joint pattern) of approved types and water seal. Traps provided with cleanouts shall have heavy brass threaded plugs with solid brass heads.
- B. Fixture traps shall be as specified under Plumbing Fixtures.
- C. All traps shall be set as close to the fixtures as possible and in no event shall this distance exceed 2 feet horizontal and 4 feet vertical. All traps shall be set level with regard to their water line.

### 2.2 CLEANOUTS

- A. Provide cleanouts at the base of all soil, waste and leader stacks.
- B. Cast Iron Pipe Cleanouts: Tapped extra heavy cast iron ferrule, caulked into cast iron fittings, and extra heavy lead seal plug with solid hexagonal nut or countersunk plug to suit.
- C. No-Hub Cast Iron Pipe Cleanouts: No-Hub cast iron cleanout plug or extra heavy brass threaded plug in tapped cast iron fittings, with solid hexagonal nut or countersunk plug to suit.
- D. Steel Pipe Cleanouts: Extra heavy brass threaded plug in drainage fitting.
- E. Cleanout Plugs: Comply with the Plumbing Code; American Standard pipe threads with approved Teflon tape applied to the male threads.
- F. Extend cleanouts to walls and floor with long sweep ells or "y" and 1/8 bends with plugs and face or deck plates to conform to the architectural finish in the room. Where no definite finish is indicated on the architectural and/or mechanical drawings, use stainless steel wall plates and floor plates of nickel bronze.
- G. Cleanouts shall be not more than 50 feet apart in horizontal drainage lines. Accessible cleanouts shall be installed at each change of direction greater than 45° on all horizontal drainage lines. All cleanouts shall be installed so that the cleanout opens in the direction of flow or at right angles thereto. Cleanouts shall be of same size as pipes up to 4 inches and not less than 4 inches for larger piping.



### **2.3 DRAINS**

- A. The drain schedule on the drawings indicates the particular drain desired at the various locations indicated on the Drawings.
- B. Locations of drains shown on the drawings shall be verified by this trade.
- C. All drains shall include adjustable clamping collars device where membrane or other waterproof floors or decks occur.
- D. All drains shall include extension collars as required to suit roof, floor or deck construction.

### **2.4 DOWNSPOUT NOZZLE**

- A. Provide a polished bronze downspout nozzles in accordance with the Contract documents, with vandal proof screws, diameter of outlet noted on plans.

### **2.5 MANUFACTURERS**

- A. Cleanouts and Drains and Down Spout Nozzles
  - 1. Wade
  - 2. Zurn
  - 3. J.R. Smith
  - 4. Mifab
  - 5. Approved Equal

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 OPERATING INSTRUCTIONS PERIOD**

- A. Provide one day of instructions.

**END OF SECTION 22 14 23**



**Department of  
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Construction**

FMS No. S136-383S  
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**SECTION 22 16 01**  
**NATURAL GAS SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

A. The following documents apply to all required work for the Project:

1. The Contract Drawings
2. The Specifications
3. The General Conditions
4. The Addendum
5. The Contract (City of New York Standard Construction Contract)

**1.2 DESCRIPTION**

A. Provide a natural gas system in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

A. A complete distribution system of natural gas extended to all gas using equipment.

**1.4 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Coordinated piping, inserts, structural openings, drawings, including coordinates and elevations.
- C. Indicate proposed changes in pipe sizes and changes in basic system scheme.
- D. Cuts of piping, valves, pumps and equipment connectors used for this section.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Applicable Standards
  1. Current edition of the New York City Fuel Gas Code
  2. New York City Building Code (2014)



3. National Fuel Gas Code - NFPA 54.
4. Rules and Regulations of National Grid
- C. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- E. Installer Qualifications: Company specializing in performing the Work of this Section with minimum three (3) years documented experience.
- F. Conformance to ANSI B31.
- G. Gas regulators shall be AGA rated.

## **PART 2 - PRODUCTS**

### **2.1 PIPING**

- A. Steel Pipe: ASTM A 53/A 53M, 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.
  4. PIPING SCHEDULE
    - a. Application
      - 1) Steel pipe with malleable-iron fittings and threaded joints, all gas piping up to 4" (½"psig)
      - 2) Steel pipe with wrought-steel fittings and welded joints, All gas piping operating over ½"psig to 5 psig and sizes 4" and larger.
      - 3) Steel pipe with wrought-steel fittings and welded joints, all gas piping operating over 5 psig
  5. EXCEPTIONS:
    - a. All exposed piping 1½ inches and smaller located within areas utilized as return air plenums shall have welded joints with Schedule 40 socket welded forged steel fittings conforming to ASME B16.11.



- b. All exposed piping 1½ inches and smaller from main natural gas riser to each emergency shut-off valve shall have welded joints with Schedule 40 socket welded forged steel fittings conforming to ASME B16.11.

**B. Fittings**

1. Threaded: Malleable iron threaded fittings.
2. Welded: Standard weight steel welded fittings complying with regulations of ASA B16.9 and ASTM A-234.

**C. JOINING MATERIALS**

1. Joint Compound and Tape: Suitable for natural gas.
2. 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.
3. Brazing Filler Metals: Alloy with melting point greater than 1000 deg F complying with AWS A5.8/A5.8M. Brazing alloys containing more than 0.05 percent phosphorus are prohibited.

**2.2 VALVES**

- A. All valves shall be designed, manufactured and approved for natural gas service.
- B. Line Shut-off Valves sizes 2 inches and smaller shall be iron body lubricated plug valve conforming to ASTM-A-126, U.L. Listed and A.G.A. Approved for natural gas service with threaded ends, wrench operation, rated for 200 WOG service pressure and -20 to 200 degrees F.,
- C. Line Shut-off Valves sizes 2½ inches and larger shall be iron body lubricated plug valve conforming to ASTM-A-126, U.L. Listed and A.G.A. Approved for natural gas service with flanged ends, wrench operation, rated for 200 WOG service pressure and -20 to 200 degrees F.,
- D. Appliance/Equipment Shut-off Valves at local connections sizes 2 inches and smaller shall be bronze body, full port ball or butterfly type, U.L. Listed and A.G.A. Approved for natural gas service with threaded ends, quarter turn lever handle operation, rated for 175 W.O.G. service pressure and 30 to 275 degrees F.,
- E. Manual Emergency Shut-off Valves sizes 2 inches and smaller shall be bronze body, full port ball or butterfly type, U.L. Listed and A.G.A. Approved for natural gas service with threaded ends, quarter turn lever handle operation, rated for 175 W.O.G. service pressure and 30 to 275 degrees F.
- F. Automatic Emergency Shut-off Valves shall be U.L. Listed F.M. Approved for natural gas service, 2-way electrically tripped solenoid type; fail safe closed; manual reset; Type 1 solenoid enclosure; NBR seals and disc; stainless steel core tube and springs; copper coil.



**G. PRESSURE REGULATORS**

1. General Requirements:

- a. Single stage and suitable for natural gas.
- b. Steel jacket and corrosion-resistant components.
- c. Elevation compensator.
- d. End Connections: Threaded for regulators NPS 2 and smaller.

2. Appliance Pressure Regulators: Comply with ANSI Z21.18. 1.

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- b. Body and Diaphragm Case: Die-cast aluminum.
- c. Springs: Zinc-plated steel; interchangeable.
- d. Diaphragm Plate: Zinc-plated steel.
- e. Seat Disc: Nitrile rubber.
- f. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
- g. Factory-Applied Finish: Minimum three-layer polyester and polyurethane paint finish.
- h. Atmospheric Vent: Factory installed.
- i. Maximum Inlet Pressure: 2 psig

3. Line Pressure Regulators: Comply with ANSI Z21.80. 1

- a. Body and Diaphragm Case: Cast iron or die-cast aluminum.
- b. Springs: Zinc-plated steel; interchangeable.
- c. Diaphragm Plate: Zinc-plated steel.
- d. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
- e. Orifice: Aluminum; interchangeable.
- f. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.



- g. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator
- h. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 120 percent of design discharge pressure at shutoff.
- i. Overpressure Protection Device: Factory mounted on pressure regulator.
- j. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
- k. Maximum Inlet Pressure: 5 psig 13. Suitable for outdoor use to minus 40 F ambient temperature.

#### 4. DIELECTRIC UNIONS

- a. Description: Standard: ASSE 1079. Pressure Rating: 125 psig at 180 deg F. , End Connections: Solder-joint copper alloy and threaded ferrous.

#### H. Equipment Connections

- 1. Rough-In: The minimum rough-in size for any equipment or appliances shall be as indicated on equipment or appliance or 3/4" whichever is greater. In no case shall rough-in be less than 3/4".
- 2. Shutoff Valves: Every piece of equipment or appliance shall have a straight shutoff valve located no more than 2'-0" from equipment or appliance connection. Valve must have lever handle and be certified by A.G.A. for use as gas shutoff.

### 2.3 MANUFACTURERS

- A. Walworth
- B. Rockwell-Nordstrom (basis of design)
- C. McDonald, A. Y. Mfg. Co
- D. Hart Industries International, Inc
- E. Maxitrol Company
- F. Pietro Fiorentini
- G. Approved equal



## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 INSTALLATION**

- A. 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.
- B. Provide meter and regulator including all vents as required by local utility.
- C. Locate valves for easy access.
- 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. Where gas risers are indicated on drawings, run same in a 2-hour rated shaft vented at the top as described in NFPA Pamphlet 54. Shutoff valves shall be provided immediately adjacent to the shaft wall. All shaft openings shall be sealed.
- F. Provide drip leg at base of each vertical change of direction.
- G. No bushings shall be used.
- H. Furnish and install all vent piping as required.
- I. Install piping free of sags and bends.
- J. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- K. Connect branch piping from top or side of horizontal piping
- L. Do not use natural-gas piping as grounding electrode
- M. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- N. Install pressure gage downstream from each line regulator.
- O. Install escutcheons for piping penetrations of walls, ceilings, and floors.
- P. Install manual gas shutoff valve for each gas appliance.
- Q. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.



- R. Ream ends of pipes and tubes and remove burrs.
- S. Used pipe, fittings, valves and other materials shall not be reused.

**3.3 ADJUSTMENTS**

- A. Adjust regulators to provide required pressure on branches, all under the supervision of local utility.

**3.4 OPERATING INSTRUCTIONS**

- A. Provide one day of instructions.

**3.5 NATURAL GAS SYSTEMS**

- A. Upon completion of a section of a gas system or of the entire gas system and before appliances are connected thereto, the completed section or system shall be verified as to materials, and tested and proven tight as described hereafter.

**B. Gas Distributing Piping**

- 1. Piping shall be tested in accordance with the following criteria:

Operating Pressure	Test Pressure	Duration	X-Ray Testing Required
Less than 1/2 psig	3 psig	1 hour	No
1/2 psig to 3 psig	50 psig	1 hour	No
3 psig to 15 psig	100 psig	1 hour	No
15 psig and above	100 psi or 2 times operating pressure whichever is greater	2 hour	Yes.  X-Ray shall be provided in accordance with Fuel Gas Code Requirements.

**C. Meter Piping**

- 1. Meter piping shall be pressure tested in accordance with the requirements of the serving utility. These requirements shall be either the same as those for testing distribution piping in paragraph B, or if different, the piping shall be certified by the local utility as being tested in compliance with their requirements.
- 2. Notwithstanding the above, all coated or wrapped pipe shall be pressure tested at a minimum of ninety psig.



**D. PAINTING**

1. Comply with requirements in Section 099123 Painting for exterior painting
2. Paint exposed, exterior metal piping, valves, regulators, and piping specialties, except components, with factory-applied paint or protective coating.
  - a. Gloss finish, color - Yellow.

**E. Testing Procedure**

1. For testing, the piping shall be filled with air or an inert gas, and the source of pressure shall be isolated before the pressure readings are made. All test duration time periods are to be measured after stabilization of testing medium. Fresh water may be used as the test medium only where the required test pressure exceeds one hundred psig.

**END OF SECTION 22 16 01**



**SECTION 23 00 05  
ACCESS DOORS IN GENERAL CONSTRUCTION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Access Doors in Drywall.
- B. Access Doors in Ceilings.
- C. Fire Rated Access Doors.
- D. Color Coded Buttons.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Provide manufacturer's data on access doors to be furnished in each type of general construction by location within the project.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements"



## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Wherever access is required through walls or ceilings to valves, fire dampers, fire and smoke dampers, automatic and balancing dampers, or other concealed equipment installed under this Division, furnish access doors as follows in this section.
- B. Flush door in drywall:
  - 1. Milcor – Type DW
  - 2. KARP – Type KDW
  - 3. Williams Brothers – Type WB
  - 4. Elmdor – Type AP
  - 5. Or approved equal
- C. Recessed door in walls and ceilings:
  - 1. Milcor – Type AP
  - 2. Karp – Type RDW
  - 3. Williams Brothers – Type WB-RDW
  - 4. Elmor – Type AT
  - 5. Or approved equal
- D. Recessed door in finished plaster or ceramic tile:
  - 1. Milcor – Type AP
  - 2. Karp – Type KATR
  - 3. Williams Brothers – Type WB-AP
  - 4. Elmdor – Type AP
  - 5. Or approved equal
- E. In fire rated construction:
  - 1. Milcor – Type UFR



2. Karp – Type 350 FR
  3. Williams Brothers – Type WB-ATR
  4. Elmdor – Type FR
  5. Or approved equal
- F. Provide access doors in rated construction with "B" label fire construction. Furnish a U.L. label on each access door.
- G. No access door shall be installed until location and type have been approved by the Commissioner.
- 2.2 Furnish color coded buttons or tabs to indicate location of valves, dampers or other equipment located above removable type ceilings where access doors are not required.
- 2.3 Make access door size a minimum of 18" x 18".
- 2.4 **MANUFACTURERS:**
- A. Miller
  - B. Karp
  - C. Williams Brothers
  - D. Elmdor
  - E. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements
- B. Coordinate sizes and location of all access doors with Contractor.
- C. Direct location and setting of access doors in hung ceilings, furred spaces, walls, etc., to provide access to all concealed work items requiring maintenance and/or adjustment and as directed by the Commissioner. Obtain acceptance of the Commissioner for the locations and sizes of such access doors.



- D. Locate and group equipment requiring access doors so that access door locations are aesthetically acceptable. Coordinate location of equipment requiring access with other trades to minimize number of access doors in one area. Prepare drawings of valve and damper locations indicating proposed access door locations for review by the Commissioner prior to installation of valves, dampers, etc. Include equipment of other trades on the Drawing.

**END OF SECTION 23 00 05**



**SECTION 23 02 00  
FIRESTOPPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Firestop Compounds.
- B. Damming Material.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit shop drawings, product data, and manufacturer's installation instructions for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site.
- C. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details shall accurately reflect actual job conditions.
- D. Submit Material Safety Data Sheets with product delivered to job site.
- E. Submit U.L. for the complete system of firestopping for each type penetration.
- F. Submit complete details of each type of penetration to be used indicating the proper U.L. approved firestop system and U.L. system number.



**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Firestop system installation shall conform to requirements of qualified designs or manufacturer approved modifications, as supported by engineering reports.
- C. Install firestop materials and systems as required by these Contract Documents
- D. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials (firestop system) meets the requirements specified in accordance with the applicable referenced standards.
- E. The firestop compound shall not contain any solvents or inorganic fibers. The penetration seal material must be unaffected by moisture and must maintain the integrity of the floor or wall assembly for its rated time period when tested in accordance with ASTM E814 (UL1479). The system shall be U.L. Classified for up to and including 3 hours.

Line #	Penetrating Item	Type of Rated Wall/Floor	Rating (Hrs.)	U.L. System #
1	Steel Pipe (12" or smaller)	Concrete or Concrete Block	3	399
2	Steel Pipe or EMT Conduit	Concrete or Concrete Block	2	215, 216, 223
3	Steel Pipe or EMT Conduit	Concrete or Concrete Block	1	221
4	Steel Pipe or EMT Conduit	Gypsum Wall	2	425
5	Steel Pipe or EMT Conduit	Wood Floor Assembly	2	306
6	Copper Pipe (not insulated)	Concrete or Concrete Block	2	400
7	Insulated Steel Pipe/Conduit	Concrete or Concrete Block	2	301
8	Insulated Copper Pipes(s)	Concrete or Concrete Block	2	310, 402, 403
9	PVC Pipe (6" or smaller)	Concrete or Concrete Block	2	300, 226
10	PVC Pipe (4" or smaller)	Concrete or Concrete Block	3	300



Line #	Penetrating Item	Type of Rated Wall/Floor	Rating (Hrs.)	U.L. System #
11	PVC Pipe (4" or smaller)	Gypsum Wall	2	312, 227, 228
12	PVC Pipe (4" or smaller)	Wood Floor Assembly	2	303
13	CPVC and PB Pipe	Concrete or Concrete Block	2	226
14	ABS Pipe (2" or smaller)	Gypsum Wall	2	227
15	PP Pipe (4" or smaller)	Concrete or Concrete Block	2	300
16	Glass Pipe (4" or smaller)	Concrete or Concrete Block	2	302
17	Cables (Power, Control, Phone)	Concrete or Concrete Block	2, 3	222, 224, 307
18	Cables (Power, Control)	Gypsum Wall	2	425
19	Phone Cable (25 pair or smaller)	Wood Floor Assembly	2	304
20	Joints (up to 3" wide)	Concrete or Concrete Block	2	214
21	Blank Opening	Concrete or Concrete Block	2	311

## PART 2 - PRODUCTS

### 2.1 FIRESTOPPING

- A. Provide firestop compounds for caulk, pour, trowel or pump application. Material must be capable of sealing openings around single or multiple against fire, smoke and toxic gases, and maintaining rating with a thickness no greater than the structure.
- B. Provide a damming material, where required, per manufacturer's recommendations and as shown on the Drawings.
- C. Provide a firestop system consisting of a material, or combination of materials, to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke or gases through penetrations in fire-rated barriers. It shall be used in specific locations as follows:
  1. Penetrations for the passage of through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
  2. Locations shown specifically on the drawings or where specified in other sections of these specifications.



## 2.2 MATERIALS

- A. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating item(s) without affecting the adhesion or integrity of the system.
- B. Firestopping materials shall not require hazardous waste disposal of used containers/packages.
- C. Provide firestopping materials free of solvents which will not experience shrinkage while curing.

## 2.3 MANUFACTURERS

- A. Hilti
- B. Dow Corning
- C. Flamesafe
- D. International Protective Coatings
- E. Or approved equal

## PART 3 - EXECUTION

- 3.1 Deliver materials to site in original unopened containers or packages bearing the manufacturer's name, brand designation, product description and U.L. Classification Mark.
- 3.2 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job site.
- 3.3 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- 3.4 Comply with recommended procedures, precautions or remedies described in Material Safety Data Sheets as applicable.

### 3.5 EXAMINATION

- A. Examine areas and conditions under which work is to be performed and notify the Commissioner in writing of conditions detrimental to proper and timely completion of the work.
- B. Verify that openings are properly sized and in suitable condition to receive the work of this section.

### 3.6 PREPARATION

- A. Clean substrate of dirt, dust, grease, oil, loose materials, rust or other matter that may affect the proper fitting or adhesion of the firestopping materials.
- B. Clean metal and glass surfaces with a non-alcohol solvent.



### **3.7 INSTALLATION**

- A. Install firestop materials as indicated in accordance with design requirements and manufacturer's instructions.
  - B. Seal all holes or voids made by penetrations to ensure an air, smoke and water-tight seal.
- 3.8** Firestopping may be required by other Subcontractors under related sections of the project specifications. Identify all locations requiring firestopping and coordinate the work of this section with work performed under other sections of the project to provide a uniform system of firestopping.
- 3.9** Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- 3.10** Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation.
- 3.11** Firestop systems do not re-establish the structural integrity of load bearing partitions. Contractor shall consult the Commissioner prior to penetrating any load bearing assembly.
- 3.12** Firestop systems are not intended to support live loads or traffic. Contractor shall consult the Commissioner if he has reason to believe these limitations may be violated.

### **3.13 FIRESTOPPING**

- A. Insulated Cold Pipes
  - 1. Install a pipe sleeve with an inside diameter large enough to include the specified thickness of insulation.
  - 2. Eliminate insulation for depth of wall and fill space between with firestop expanding foam leaving sufficient space at each end of sleeve for proper depth of firestop.
  - 3. Install firestop material at each end of sleeve to form a U.L. approved system.
  - 4. Insulate pipe on each side of wall and caulk all around insulation at joint of wall and insulation.
- B. Hot Pipes (Up to 220°F)
  - 1. Install a pipe sleeve with an inside diameter large enough to include the specified thickness of insulation.
  - 2. Eliminate insulation for depth of wall and, using section of specified insulation as backing, install proper depth of firestop material on each end of sleeve to form a U.L. approved system.
  - 3. Insulate pipe on each side of wall and caulk all around insulation at joint of wall and insulation.



C. Hot Pipes Over 220°F

1. Install proper sleeve through wall with an inside diameter large enough to include specified insulation thickness.
2. Eliminate insulation for depth of wall and, using section of specified insulation as backing, install proper depth of firestop material on each end of sleeve to form a U.L. approved system.
3. Weld a 20 gauge sheetmetal expansion compensator, as shown on the Drawings, to the Compensator to be formed "U" shape 2" wide and of sufficient length so as to be 6" above insulation. Pre-compress compensator, fill compensator with 6 lb. density fiberglass insulation.
4. Install specified insulation on each side of wall up to expansion compensator.

**END OF SECTION 23 02 00**



**SECTION 23 05 13  
ELECTRIC MOTORS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Electric Motors.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit electric motor characteristics with each equipment submission.
- C. Product Data: Manufacturer's latest published data for materials, equipment, accessories and installation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Motor efficiency is Guaranteed Minimal Efficiency according to NEMA Standard MG-1-12.53a when tested in accordance with IEEE Standard 112.

**1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.



## **PART 2 - PRODUCTS**

### **2.1 ELECTRIC MOTORS**

- A. Provide high efficiency electric motors for driving the mechanical equipment. Motors to be of proper power, construction and speed to suit the specified makes of equipment; if other makes of equipment are accepted, the proper adjustment of motor speed, power, and work of Division 26 must be included without additional cost to the City of New York.
- B. 1/2 horsepower and larger motors to be rated at 460 volts for operation on 480 volt, 3 phase, 60 hertz, alternating current systems, except as otherwise noted. 1/3 horsepower and smaller motors to be rated at 115 volts for operation on 120 volt, single phase, 60 hertz, alternating current systems, except as otherwise noted.
- C. Motors to be of constant speed, squirrel-cage type. Single phase motors to be capacitor start, induction run, or split phase type as approved for the service. Motors over 100 horsepower to be suitable for operation with reduced-voltage auto-transformer type starters.
- D. All 1/2 horsepower and larger motors to have Class B insulation suitable for ambient temperature of 40°C. when operated at 115% load.
- E. All motors to be of quiet operation, guaranteed to fulfill the specified requirements without producing any sound audible outside of Machine Rooms. All belt connected motors to have adjustable bases and set screws to maintain proper belt tension; provide proper belt guards.
- F. All motors and accessories to comply in all respects with NEMA standards.
- G. Coordinate the NEMA type of each motor with the torque and inertia load of the equipment served, and the inrush characteristics of the motor with the starter selection, so that all items furnished constitute a properly related package. No motor to operate in the service factor range.
- H. Cooling tower motors to be TEFC; others to be drip-proof construction. Motors 1 horsepower or larger to have encapsulated stator windings of the epoxy or silicone type.
- I. Fan motors to be capable of accelerating their respective fans from 0 revolutions per minute to design or synchronous revolutions per minute within a maximum of 10 seconds. Submit for approval curves which plot time versus revolutions per minute for the particular motor and fan combination.
- J. All motors used in variable speed applications to be suitable for use with variable frequency drives.
- K. Motorized equipment rated at more than 1000 watts to have a power factor not less than 95 percent under rated nameplate conditions. Provide corrective devices where required to achieve this.
- L. Provide thermistor protection for windings on all motors 25 horsepower and above. Where motors are controlled by individual motor starters, provide relays for installation under Division 26. Relays in "motor control centers" to be provided by the Contractor furnishing the motor control centers.



- M. All vertical motors 150 horsepower and above to be provided with bearing temperature detectors on thrust bearing. Provide contactors and circuitry to give remote alarm at temperatures above 175°F.

**2.2 MANUFACTURERS**

- A. General Electric
- B. Marathon
- C. Lincoln
- D. Siemens-Allis
- E. Or approved equal

**PART 3 - EXECUTION**

**3.1 WIRING**

- A. Wiring between motor and controllers will be performed under Division 26.
- B. Review BMCS Controls Documents for required accessories, interlocks, etc. Failure to fully coordinate this item with the other Divisions in no way relieves this Contractor from providing a complete, functional, and coordinated system as described.

**END OF SECTION 23 05 13**



**Department of  
Design and  
Construction**

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**SECTION 23 05 16  
EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].
- B. Provide expansion fittings and loops for HVAC piping in accordance with the Contract Documents.

**1.1 WORK INCLUDED**

- A. Flexible Ball-joint Packed Expansion Joints.
- B. Slip-joint Packed Expansion Joints.
- C. Bellows Expansion Joints.
- D. Rubber Expansion Joints.
- E. Flexible Metal Hoses.
- F. Pipe Guides.

**1.2 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturers' latest published data for materials and installation, including maximum pressure and temperature ratings.
- C. Submit sufficient calculations to indicate clear conformance to the expansion joint design equations. For bellows joints, the calculations shall be as specified in the Standards of the Expansion Joint Manufacturers Association, Inc. (EJMA), Tenth Edition, 2016, and all addenda, submit information required to calculate the thermal movement, and/or force and stress calculation, including pipe length, pipe materials.



### 1.3 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Construct guide and expansion compensators in accordance with ANSI, ASTM and ASME standards.
- C. Provide expansion compensators compatible with pressure and temperature of system installed.
- D. The expansion joint manufacturer must maintain a quality assurance system approved to ASME Code Section VIII or certified to an approved ISO 9001 specification pipe size, installation temperature and operating temperature. The manufacturer's quality assurance manual must be available upon request.
- E. Written procedures must be maintained for each of the following categories:
  - 1. Identification and control of materials.
  - 2. Drawing and document control.
  - 3. Manufacturing and process control.
  - 4. Welding qualifications and procedures.
  - 5. Testing, inspection and documentation.
  - 6. Preparation for delivery.

## PART 2 - PRODUCTS

### 2.1 FLEXIBLE BALL JOINTS

- A. General
  - 1. Packaged flexible ball joints shall be weld and type designed for injection of semi-plastic packing under full line pressure and shall be the manufacturer and model number indicated on drawings incorporating the features indicated below:
  - 2. Packaged flexible ball joints shall have integral socket/retainer without bolting. Ball joints shall be factory charged with self-lubricating injectable packing and provide for 360° rotation and total angular flex of 30° for sizes ¾" to 1-½", 33° for 2" size and 15° for size 2-½" and larger.
- B. Packing Cylinders
  - 1. Ball sphere shall be dual chrome-plated with a minimum of 1 mil hard chrome over 1 mil of crack-free hard chrome. Plating thickness shall be verified by inspection in accordance with ASTM Standard B-499 and certification shall be furnished with expansion joint.



2. Ball socket shall be one piece with integral socket/retainer to eliminate the need to threaded caps or bolted retainer flanges. Bolted retainer flanges are not acceptable.
3. Ball socket shall incorporate packing cylinders in quantities as indicated below. Packing cylinder shall be welded in place, be a minimum of 2" in diameter with internal acme threads with a discharge tip having a check valve effect to prevent blowback and permit adding packing under full-line pressure all furnished with a matching plunger having a 3/4" diameter tip. Expansion joints operating over 300 psig shall be furnished with packing cylinders having an integral stainless steel plug type safety vale for positive blowback protection.

B.J. Size	QTY
3/4"	1
4", 5" & 6"	2
8" & 10"	3
12" to 18"	4
18" to 20"	5
24"	6
30"	7

**C. Injectable Packing and Seals**

1. Stuffing box shall contain compression seals of ductile iron, teflon-graphite containment seals and flake injectable packing or approved equal. Teflon-asbestos and teflon semi-plastic injectable packings are not acceptable and shall not be used.
2. Each ball joint shall be furnished with a minimum of two (2) plugs of spare flacke semi-plastic injectable packing for each packing cylinder. For system operating over 300 psig where expansion joints are furnished with packing cylinders having an integral stainless steel plug type safety valve, tools shall be furnished to safely remove under full-line pressure the impacted packing between safety valve and discharge tip. Where project contains more than one (1) such tool furnished for every five (5) expansion joints operating above 300 psig.
3. Flexible ball joints shall be suitable up to 150 psig or operating pressure above 300 psig, based on system requirements. Packed flexible ball joint manufacturer to submit calculations verifying that length of spool piece between ball joints is ample to properly accommodate expansion and contracting, including allowance for frame shortening in buildings with concrete columns.
4. For each packing cylinder furnish a minimum of two (2) spare injectable Packing Plugs 5/8" diameter by 7/8" long or packing plugs having an equivalent volume.



5. To prevent by-pass of the injectable packing, a pressure-molded soft containment seal compatible with operating fluid pressure and temperature shall be placed at each side of the injectable packing zone adjacent to compression seals. Compression seals shall be ductile iron.

**D. Materials**

1. All pressure-containing components shall be carbon steel meeting ASTM requirements, as specified in Section VIII of ASME Code and ANSI B31.1. Ball Sphere shall be corrosion plated – a duplex chrome plate consisting of one mil of hard chrome applied over one mil of Crack-Free Chrome per ANSI B 650 Class 50 with thickness certified by per ASTM Standard B-499.
2. Ball joint shall be designed for specified pressure, but not less than 150 psi, 365°F.
3. Sizes 2" and smaller shall have ends beveled for welding to piping, as specified.
4. Sizes 2-1/2" and larger shall be furnished with ends beveled for welding to piping, as specified.

**E. Testing**

1. All ball joints shall be suitable for hydrostatic testing to 1.5 times design pressure.

**F. Performance**

1. Submittals for approval shall include the manufacturer's warranty and service guarantee information.

**2.2 PACKED SLIP EXPANSION JOINTS**

- A.** Packed slip expansion joints shall be weld end type designed for the injection of semi-plastic packing under full-line pressure and shall be the manufacturer and model number indicated on drawings incorporating the following:

1. Sliding slip shall be constructed of A53 Gr B seamless pipe – schedule 80 for sizes to 16" inclusive and schedule 60 for sizes 18" to 24" and shall incorporate stainless steel stops welded in place to prevent disengagement of slip in the event of anchor failure. Slip shall be dual chrome-plated with a minimum of 1 mil hard chrome over mil of crack-free hard chrome. Plating thickness shall be verified by inspection in accordance with ASTM Standard B-499 and certification shall be furnished with expansion joint.
2. Traverse chamber shall be seamless A-53 Grade B pipe or equivalent tubing with butt type circumferential welds only and shall be furnished with non-metallic flexible bronze-filled teflon internal and external guides to prevent scoring or binding of sliding slip.
3. Stuffing box shall be designed to provide an area of packing in contact with the sliding slip at least fifteen (15) times the nominal pipe diameter and shall incorporate one (1) packing cylinder for 1-1/2" through 4" size and one (1) additional cylinder for each 3" of nominal pipe diameter. Packing cylinders shall be welded in place, be a minimum 2" diameter with internal acme threads with a discharge tip having a check valve effect to prevent blowback and permit adding packing under full-line pressure and furnished with a matching plunger having a minimum 3/4" diameter tip. Expansion joints operating over



- 300 psig shall be furnished with packing cylinders having an integral stainless steel plug type safety valve for positive blowback protection.
4. Stuffing box shall be packed with a combination of self-lubricating teflon/graphite braided packing or approved equal and flake injectable packing. Teflon-asbestos and teflon semi-plastic injectable packings are not acceptable and shall not be used.
  5. Each expansion joint shall be furnished with a minimum of two (2) plugs of spare flake semi-plastic injectable packing for each packing cylinder. For system operating over 300 psig where expansion joints are furnished with packing cylinders having an integral stainless steel plug type safety valve, tools shall be furnished to safely remove under full-line pressure the impacted packing between safety valve and discharge tip. Where project contains more than one (1) expansion joint operating above 300 psig, a minimum of one (1) such tool furnished for every five (5) expansion joints operating above 300 psig.
  6. Expansion joints shall be suitable for 150 psig or over 300 psig based on design conditions and requirements. For expansion joints operating below 200°F, Style 200G packing with rubber and fiberglass sealing rings shall be used in lieu of Style 150 will be approved if they conform to all features specified above.

### **2.3 BELLOWS EXPANSION JOINTS**

#### **A. Design**

1. The bellows are to be designed in accordance with the bellows performance equations as listed in Sections C-1 to C-8 of the Standards of the Expansion Joint Manufacturers Association.
2. Provide all expansion joints weighing more than 500 lbs. with lifting lugs. If more than one lug is furnished, design each lug to carry the entire weight of the assembly.
3. The expansion joint shall be free of all control devices such as self-equalizing rings.

#### **B. Materials**

1. Form the bellows from multi-ply solution annealed sheet conforming to the latest ASTM or ASME material specifications for the material specified.
2. Spool pieces and flanges shall be of a material compatible with the piping or vessel adjacent to the expansion joint.
3. Provide liners of heavy gauge stainless steel.

#### **C. Fabrication and Heat Treatment**

1. Form bellows from seamless tubing or longitudinally butt-welded cylinders.
2. Planish the longitudinal butt welds after welding to within 10% of the original sheet thickness.



3. Convolutions shall be "U" shaped and formed with an even pitch and matching height. Circumferential welds joining one convolution to another are not permitted.
4. Provide bellows in the as-formed condition.
5. The schedule or wall thickness of stub ends specified on the specification sheets are those of the piping adjacent to the expansion joint. In the event that the weld ends of the expansion joint are thicker than those specified, internally machine the beveled ends to match the specified thickness.
6. All welding shall be done in accordance with ASME Section IX.
7. All bellows expansion joints to be flanged.

**D. Construction**

1. Construct single bellows units to absorb 2" total movement 1½" compression, ½" extensions 1" extension, 1" compression from factory furnished setting.
2. Form untied double bellows units by connecting two bellows with a length of center pipe. Construct to absorb 4" total movement, 3" extension, 1" compression.
3. Tied double bellows units constructed as are the untied double bellows with the addition of tie bars between flanges to limit forces transmitted to adjoining piping.
4. Provide control ring in corrugations in all joints used in steam systems and hot water systems over 200°F.
5. Provide internal liners of 304 stainless steel in all units in steam systems and water systems over 10 feet per second velocity.
6. When drop-in liners are used, provide gasket between flange and liner.
7. Provide shroud around bellows to protect against torsion, squirm, misalignment and external damage as well as providing visual evidence that the traverse of the unit has not been exceeded.

**2.4 RUBBER EXPANSION JOINTS**

- A. Provide rubber expansion joints of the spherical molded type with 150 lb. steel flanges and permanently attached control cables or rods.
- B. Construct the body of multiple layers of neoprene and bias-ply tire cord reinforcing.
- C. Cables to be galvanized aircraft cables permanently affixed to flanges to prevent joint from extending past its limit.
- D. Control rods to be steel with adjusting nuts. Length of rod to restrain joint from extending beyond joint limit.



## **2.5 FLEXIBLE METAL HOSE**

- A. Construct metal hose of corrugated, close pitch hose of bronze with bronze braid annular close pitch hose of 304 stainless steel with 304 stainless steel braid.
- B. End fittings to be 150 lb. flanges.
- C. Maximum working pressures not to exceed 200 psig.
- D. Maximum length 18".

## **2.6 PIPE GUIDES**

### **A. Spider Guides**

- 1. Construct spider guides of carbon steel throughout carbon steel housing and copper spider with armored edges.
- 2. Both spider and outer housing to be formed as (2) bolted halves.
- 3. Select size of guides to include insulation when guiding insulated pipe.
- 4. Spider guides to be pre-insulated with a section of hydrous calcium silicate extending at least 1" beyond each side of spider.
- 5. For riser guides, provide "arms" of sufficient length to contact floor slab or other support a minimum of 3" on each side.

### **B. Slide Guides**

- 1. Construct body and base of slide guides of carbon steel.
- 2. Slides to be steel with teflon on teflon graphite on graphite sliding surfaces or approved equal.
- 3. Provide slides with gusset plates on 6" and larger sizes.

### **C. Radiation Pipe Guides**

- 1. Provide 3/16" steel "L" brackets slotted on both legs to accommodate maximum adjustment in horizontal and vertical planes.
- 2. Provide thermal resistant nylon guide surrounding tubing and attached to brackets with 1/4" diameter bolts.



## **2.7 MANUFACTURERS**

- A. Keflex
- B. Flexway
- C. Senior Flexonics Pathway
- D. Advanced Thermal Systems
- E. Yarway
- F. Adscio
- G. STS Industrial
- H. Metraflex
- I. Or approved equal.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Install joints at correct length as specified by manufacturer for each location so that unit will work within specified limits.
- B. Provide adequate anchoring and guiding.
- C. Pre-compress joints per manufacturer's recommendation when installing in cold water piping.
- D. Pre-extend joints per manufacturer's recommendation when installing in hot water or steam piping.
- E. Align joint flange and pipe flange holes. Do not try to compensate for flange or pipe misalignment by putting any torsional, compressive, extension, or offset loads on the expansion joint.
- F. Remove shipping restraints after installation, but before hydrotesting.
- G. All installation procedures to conform to EJMA Safety Recommendations.

### **3.2 BELLOWS EXPANSION JOINTS**

- A. Single bellows to be used where joint is subject to axial movement only.
- B. Protect the bellows element from damage. Do not install damaged joints.



- C. Internally pressurized expansion joints are to be installed in the proper orientation with respect to direction of flow.
- D. Unit lengths must not be altered during installation except for the application of cold pull.
- E. Water free of halogens to be used for hydrotesting.
- F. Paints containing low melting point metals or their compounds, particularly aluminum, lead or zinc, must not be allowed to come into contact with the bellows convolutions.

### **3.3 RUBBER EXPANSION JOINTS**

- A. Use only in systems where temperatures do not exceed manufacturer's recommendation at any operating condition.
- B. Use only in fully accessible locations where not concealed.
- C. Protect joint at all times during construction of project. Replace all damaged joints.

### **3.4 FLEXIBLE METAL HOSES**

- A. Use only at pump inlets and outlets.
- B. Install in a straight line with no offsets.
- C. Support piping so that no weight is on the hose.
- D. Do not use bronze construction in piping over 4".

### **3.5 PIPE GUIDES**

- A. Insulated piping to be provided with a section of calcium silicate, same thickness as required insulation, with aluminum jacket to extend 1" beyond each end of spider guide.
- B. Guides to be welded or bolted to structure.
- C. Slide guides to be welded to pipe along full length of contact surface. On insulated pipe, weld slide guide to metal shield with shield welded to pipe.

**END OF SECTION 23 05 16**



**Department of  
Design and  
Construction**

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**SECTION 23 05 17  
SLEEVES AND SEALS FOR HVAC PIPING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide a U.L. approved firestopping system in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Firestop Compounds.
- B. Damming Material.
- C. Factory Assembled Devices.
- D. Sleeves
- E. Escutcheons

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit shop drawings, product data, and manufacturer's installation instructions for all materials and prefabricated devices, providing descriptions sufficient for identification at the job site.
- C. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details shall accurately reflect actual job conditions.
- D. Submit Material Safety Data Sheets with product delivered to job site.
- E. Submit U.L. for the complete system of firestopping for each type penetration.



- F. Submit complete details of each type of penetration to be used indicating the proper U.L. approved firestop system and U.L. system number.
- G. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions.
- H. Submit manufacturer's installation procedure for each type of product.

#### **1.4 INSTALLER QUALIFICATIONS**

- A. Engage an experienced Installer who is qualified by the firestopping manufacturer as having been properly trained to install manufacturer's products per specified requirements.
- B. Firm with not less than 3 years' experience with fire stop installation.

#### **1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  - 1. ASTM E-814, "Fire Test of Penetration Fire Stops."
  - 2. ANSI/UL 1479, "Fire Tests of Through Penetration Firestops."
  - 3. ASTM E-119, "Fire Tests of Building Constructions and Materials."
  - 4. ANSI/UL263, "Fire Tests of Building Construction and Materials."
  - 5. ASTM E-84, "Surface Burning Characteristics of Building Materials."
  - 6. ANSI/UL723, "Surface Burning Characteristics of Building Materials."
  - 7. ASTM G-21, "Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi."
- C. Firestop system installation shall conform to requirements of qualified designs or manufacturer approved modifications, as supported by engineering reports.
- D. Install firestop materials and systems as required by these Contract Documents.
- E. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials (firestop system) meets the requirements specified in accordance with the applicable referenced standards.



- F. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- G. The firestop compound shall not contain any solvents or inorganic fibers. The penetration seal material must be unaffected by moisture and must maintain the integrity of the floor or wall assembly for its rated time period when tested in accordance with ASTM E814 (UL1479). The system shall be U.L. Classified for up to and including 3 hours.

Line #	Penetrating Item	Type of Rated Wall/Floor	Rating (Hrs.)	U.L. System #	Tested System
1	Steel Pipe (12" or smaller)	Concrete or Concrete Block	3	399	CAJ1155
2	Steel Pipe or EMT Conduit	Concrete or Concrete Block	2	215, 216, 223	CAJ1155
3	Steel Pipe or EMT Conduit	Concrete or Concrete Block	1	221	CAJ1155
4	Steel Pipe or EMT Conduit	Gypsum Wall	2	425	WL1056
5	Steel Pipe or EMT Conduit	Wood Floor Assembly	2	306	FC1059 FC1009
6	Copper Pipe (not insulated)	Concrete or Concrete Block	2	400	FA1017
7	Insulated Steel Pipe/Conduit	Concrete or Concrete Block	2	301	CAJ5098
8	Insulated Copper Pipes(s)	Concrete or Concrete Block	2	310, 402, 403	FA5017
9	PVC Pipe (6" or smaller)	Concrete or Concrete Block	2	300, 226	CAJ2109 CAJ2217
10	PVC Pipe (4" or smaller)	Concrete or Concrete Block	3	300	CAJ2095
11	PVC Pipe (4" or smaller)	Gypsum Wall	2	312, 227, 228	WL2251
12	PVC Pipe (4" or smaller)	Wood Floor Assembly	2	303	FC2029
13	CPVC and PB Pipe	Concrete or Concrete Block	2	226	
14	ABS Pipe (2" or smaller)	Gypsum Wall	2	227	WL2234 WL2235
15	PP Pipe (4" or smaller)	Concrete or Concrete Block	2	300	CAJ2217



Line #	Penetrating Item	Type of Rated Wall/Floor	Rating (Hrs.)	U.L. System #	Tested System
16	Glass Pipe (4" or smaller)	Concrete or Concrete Block	2	302	WL2330
17	Cables (Power, Control, Phone)	Concrete or Concrete Block	2, 3	222, 224, 307	CAJ3285 CAJ3096
18	Cables (Power, Control)	Gypsum Wall	2	425	WL3334 WL3396
19	Phone Cable (25 pair or smaller)	Wood Floor Assembly	2	304	FC3012
20	Joints (up to 3" wide)	Concrete or Concrete Block	2	214	HWD1008 HWD1045 HWD1058
21	Blank Opening	Concrete or Concrete Block	2	311	CAJ0138 CAJ0105 CAJ0097 CAJ0090

**PART 2 - PRODUCTS**

**2.1 GENERAL**

- A. The following specifications represent desired design, material, and construction standards for the various items of work. Manufacturer names and model numbers are used to describe specific types, styles and quality.

**2.2 SLEEVES**

- A. Construct sleeves for pipes passing through partitions, hung or furred ceilings, etc., of not lighter than 18 gauge galvanized steel.
- B. Provide standard weight galvanized steel pipe sleeves at all penetrations of foundation walls, block walls, reinforced concrete walls, and all floor and roof slab penetrations.
- C. Provide 25 gauge waterproof galvanized sheet metal counter-flashing at all pipe roof penetrations.
- D. Sleeve Sizes
  - 1. Sleeves shall be of adequate diameter to allow pipe, insulation, and firestopping to fit.
  - 2. Sleeves shall provide a minimum 1" clearance around pipes smaller than 4" and 2" clearance around pipes 4" and larger.



3. Sleeve Lengths

Location	Sleeve Length
Mechanical Room Floors and Sleeves Pipes in Shafts	All floor sleeves to extend minimum of 2" above finished floor level.
Walls and Partitions	Equal to depth of construction and terminated flush with finished surfaces.

E. Foundation Wall Penetrations

1. The pipe to wall sleeve penetration closure shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall sleeve opening. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely watertight seal between the pipe and wall opening. The seal shall be constructed so as to provide electrical insulation between the pipe and wall, thus reducing chances of cathodic reaction between these two members.
2. Contractor shall determine the required inside diameter of each individual wall opening or sleeve before ordering, fabricating or installing. The inside diameter of each wall opening shall be sized as recommended by the manufacturer to fit the pipe and to assure a watertight joint. If pipe O.D. is non-standard due to coating, insulation, etc., consult manufacturer for assistance before proceeding with wall opening detail.

**2.3 FIRESTOPPING**

- A. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.
- B. Provide firestop compounds for caulk, pour, trowel or pump application. Material must be capable of sealing openings around single or multiple against fire, smoke and toxic gases, and maintaining rating with a thickness no greater than the structure.
- C. 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 the firestopping manufacturer based on testing and field experience.
- D. Provide a damming material, where required, per manufacturer's recommendations and as shown on the Drawings.



- E. Provide a firestop system consisting of a material, or combination of materials, to retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke or gases through penetrations in fire-rated barriers. It shall be used in specific locations as follows:
1. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
    - a. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.
  2. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
    - a. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
    - b. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
    - c. W-Rating: Class 1 rating in accordance with water leakage test per UL 1479 (when applicable).
  3. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
    - a. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.
  4. Locations shown specifically on the drawings or where specified in other sections of these specifications.
- F. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of one (1) or less as tested per ASTM G21.

## 2.4 MATERIALS

- A. Firestopping materials/systems shall be flexible to allow for normal movement of building structure and penetrating item(s) without affecting the adhesion or integrity of the system.
- B. Firestopping materials shall not require hazardous waste disposal of used containers/packages.
- C. Provide firestopping materials free of solvents which will not experience shrinkage while curing.
- D. Use only firestop products that have been UL 1479 or ASTM E 814 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

**2.5 MANUFACTURERS**

- A. Hilti (Basis of Design)
- B. Dow Corning
- C. Flamesafe
- D. International Protective Coatings
- E. Link Seal
- F. Or approved equal.

**2.6 PERFORMANCE**

- A. **Cast-in-Place Firestop Devices:** Factory-assembled devices for use in cast-in-place concrete floors and consisting of a polypropylene sleeve lined with an intumescent strip, an extended rectangular flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket (Provide water module attachments when W-ratings are required)
- B. **Fire Rated Cable Management Devices:** Factory-assembled round metallic sleeve device for use with cable penetrations, containing an integrated smoke seal fabric membrane that can be opened and closed for re-penetration.
- C. **Smoke and Acoustic Sleeves (Non-rated assembly):** Factory-assembled round metallic sleeve device for use with cable penetrations for non-rated walls, containing an integrated material enabling ease of re-penetration with the intent to significantly reduce sound transmission and preventing smoke passage.
- D. **Firestop Cable Collar:** Factory-assembled collars formed from galvanized steel, completely filled with an intumescent material that can accommodate 0% up to 100% visual fill. Surface mounted device.
- E. **Firestop Cable Disk:** For use with up to a 1" cable bundle, consisting of non-hardening dielectric, water-resistant putty; containing no solvents, inorganic fibers, or silicone compounds
- F. **Drop-In Firestop Devices:** Factory-assembled devices for use with combustible or noncombustible penetrants in cored holes within concrete floors. Device shall consist of galvanized steel sleeve lined with an intumescent strip, an extended rectangular flange attached to one end of the sleeve for fastening to concrete floor, and neoprene gasket.
- G. **Firestop Board:** Non-curing, re-penetrable materials used for large size/complex penetrations
- H. **Latex Sealants:** Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- I. **Firestop Devices:** Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.



- J. Intumescent Putties: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- K. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- L. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- M. Blocks/Plugs: Intumescent flexible block/plug suitable for reuse in re-penetration of openings. Blocks shall allow up to 12" of unreinforced annular space.
- N. Tub Box Kit: Cast-in place pre-formed plastic tub box kit with three support legs for use with drain piping assembly associated with bathtub installations.
- O. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- P. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and non-sag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of non-sag grade for both opening conditions.

## 2.7 ESCUTCHEONS

- A. Cast iron or cast brass, deep type, to cover sleeve hubs or fitting projections. Provide escutcheons for exposed piping through floors, ceiling, walls and partitions in finished areas, and piping through all fire rated separations. Attach escutcheon to building material, not to pipe.

## PART 3 - EXECUTION

- 3.1 Deliver materials to site in original unopened containers or packages bearing the manufacturer's name, brand designation, product description and U.L. Classification Mark.
- 3.2 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job site.
- 3.3 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.
- 3.4 Comply with recommended procedures, precautions or remedies described in Material Safety Data Sheets as applicable.



**3.5 EXAMINATION**

- A. Examine areas and conditions under which work is to be performed and notify the Commissioner in writing of conditions detrimental to proper and timely completion of the work.
- B. Verify that openings are properly sized and in suitable condition to receive the work of this section.

**3.6 PREPARATION**

- A. Clean substrate of dirt, dust, grease, oil, loose materials, rust or other matter that may affect the proper fitting or adhesion of the firestopping materials.
- B. Clean metal and glass surfaces with a non-alcohol solvent.
- C. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.

**3.7 INSTALLATION**

- A. Install firestop materials as indicated in accordance with design requirements and manufacturer's instructions.
- B. Seal all holes or voids made by penetrations to ensure an air, smoke and water-tight seal.
- C. Consult with Commissioner and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

**3.8** Firestopping may be required by other Subcontractors under related sections of the project specifications. Identify all locations requiring firestopping and coordinate the work of this section with work performed under other sections of the project to provide a uniform system of firestopping.

**3.9** Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

**3.10** Schedule installation of cast in place firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete.

**3.11** Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation.

**3.12** Firestop systems do not re-establish the structural integrity of load bearing partitions. Contractor shall consult the Commissioner prior to penetrating any load bearing assembly.

**3.13** Firestop systems are not intended to support live loads or traffic. Contractor shall consult the Commissioner if he has reason to believe these limitations may be violated.



### 3.14 FIRESTOPPING

#### A. Insulated Cold Pipes

1. Install a pipe sleeve with an inside diameter large enough to include the specified thickness of insulation.
2. Eliminate insulation for depth of wall and fill space between with firestop expanding foam leaving sufficient space at each end of sleeve for proper depth of firestop, unless the UL tested system being used does NOT require the removal of any pipe insulation to restore the rating of the penetration.
3. Install firestop material at each end of sleeve to form a U.L. approved system.
4. Insulate pipe on each side of wall and caulk all around insulation at joint of wall and insulation.

#### B. Hot Pipes (Up to 220°F)

1. Install a pipe sleeve with an inside diameter large enough to include the specified thickness of insulation.
2. Eliminate insulation for depth of wall and, using section of specified insulation as backing, install proper depth of firestop material on each end of sleeve to form a U.L. approved system, unless the UL tested system being used does NOT require the removal of any pipe insulation to restore the rating of the penetration.
3. Insulate pipe on each side of wall and caulk all around insulation at joint of wall and insulation.

#### C. Diesel Exhaust Pipes and Hot Pipes Over 220°F

1. Install proper sleeve through wall with an inside diameter large enough to include specified insulation thickness.
2. Eliminate insulation for depth of wall and, using section of specified insulation as backing, install proper depth of firestop material on each end of sleeve to form a U.L. approved system, unless the UL tested system being used does NOT require the removal of any pipe insulation to restore the rating of the penetration.
3. Weld a 20 gauge sheetmetal expansion compensator, as shown on the Drawings, to the Compensator to be formed "U" shape 2" wide and of sufficient length so as to be 6" above insulation. Pre-compress compensator, fill compensator with 6 lb. density fiberglass insulation.
4. Install specified insulation on each side of wall up to expansion compensator.

**END OF SECTION 23 05 17**



**SECTION 23 05 19  
METERS AND GAUGES FOR HVAC PIPING AND DUCTWORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide instruments in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Thermometers and Temperature Wells.
- B. Hydronic Pressure Gauges.
- C. Test Plugs.
- D. Air Pressure Gauges.
- E. Light-activated Thermometers.
- F. Gauge Attachments.
- G. Test-plug Kits.
- H. Sight Flow Indicators.
- I. Flowmeters.
- J. Thermal-energy Meters.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.



- B. Submit an overall schedule of instruments to be utilized for the project indicating service and instrument model number.
- C. Submit a line-by-line statement of compliance, meeting the intent, non-compliance or not, available for each clause of this specification.
- D. Product Data: Submit manufacturer's latest published data for instrument types, materials, accessories and installation.
- E. Shop Drawings: Submit shop drawings of instrument display boards, along with other shop or field fabricated installations.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Instruments are to be factory calibrated for the temperature and pressure of the systems in which they are installed.
- C. Instruments to be industrial quality.

**PART 2 - PRODUCTS**

**2.1 THERMOMETERS AND TEMPERATURE WELLS**

- A. Provide duct thermometers of the dial face type, 3" diameter, bimetal hermetically sealed. Accuracy is to be factory calibrated to  $\pm 1^{\circ}\text{F}$ , for the average temperature of the system in which it is installed. Construction to be stainless steel with external calibration adjustment.
- B. Provide pipe insertion thermometers of the 9" blue liquid reading scale,  $2^{\circ}\text{F}$  increments separable socket, adjustable angle with brass socket . Provide the following socket lengths:

Pipe Size	Insertion Length
4" and 5"	2½"
6" and 8"	5"
10" and over	7"

- C. Provide pipe surface mount 2" diameter thermometers of the strap on, spring held type with insulating cup. Spring shall be stainless steel shall be heat-treated bimetallic.
- D. Provide thermometers with ranges as follows:
  - 1. Duct Systems:  $0^{\circ}$  to  $160^{\circ}\text{F}$ .



2. Chilled Water Systems:
  - a. Glass: 0° to 120°F.
  - b. Dial: 0° to 150°F
3. Hot Water Systems:
  - a. Glass: 30° to 240°F
  - b. Dial: 50° to 300°F
4. Secondary Water Systems:
  - a. Mercury: 30° to 240°F
  - b. Dial: 0° to 300°F

E. Manufacturers

1. Weiss
2. Terice
3. Taylor
4. Ashcroft
5. Weksler
6. Miljoco
7. Moeller
8. Or approved equal

**2.2 PRESSURE AND COMPOUND GAUGES**

- A. Provide gauges of the bourdon tube type or phenolic with minimum 4-½" dial and die cast aluminum case with black enamel finish. Gages shall have safety blow-out back. The movement to be all stainless steel with Grade A phosphor bronze bourdon tube brazed at socket and tip. Provide accuracy of the gauge within ½% of the scale range. The pointer will be the micrometer adjustment type recalibrated from the front.
- B. Pressure gauges installed at pumps shall be liquid-filled type.
- C. Provide needle-type isolation valves at each pressure gauge.



D. Manufacturers

1. Weiss
2. Tetric
3. Taylor
4. Ashcroft
5. Weksler
6. Miljoco
7. Moeller
8. Or approved equal

**2.3 TEST PLUGS AND KITS**

A. Provide test plugs 1/2" NPT made of brass body and cap with rubber EPDM core or approved equal.

B. Provide kit consisting of:

1. (1) 1/4" NPT pressure gauge with minimum 4" dial face with a range of 0 psi to 150 psi.
2. (1) 1/4" NPT compound gauge with minimum 4" dial face with a range of - 15 psi to +30 psi,
3. (2) Ball valves, (1) needle valve, (3) 1/4" coupling adaptors, (3) 1/2" x 1/4" bushings,
4. (3) 3/4" x 1/4" bushings, (3) 3-foot long flexible hoses with female threaded swivel couplings, auxiliary test cock, (1) stainless steel 1" dial face stem thermometer minimum 4" long with a range of 0° to 220°F, (1) adjustable angle stainless steel stem thermometer with minimum 3" dial face with 4" stem with a range of 25° to 125°F, 0° to 250°F, 50° to 500°F.
5. A shock resistant molded plastic case with foam inserts and carrying strap.

C. Manufacturers

1. Test Plugs
  - a. MG Piping Products
  - b. Ernst
  - c. Weksler
  - d. Texas Fairfax



- e. Or approved equal
- 2. Test Kits
  - a. Gage IT, Inc.
  - b. Tel Tru
  - c. PTC
  - d. Weksler
  - e. Weiss
  - f. Or approved equal

#### **2.4 AIR PRESSURE GAUGES**

- A. Magnehelic Gauge: 4" dial with frictionless magnetic movements. Gauge to operate without use of fluid. Range to be compatible with service. Accuracy  $\pm 2\%$  of scale. Die cast aluminum case with clear plastic face and "O" ring seal. Diaphragm to be silicone rubber with cobalt magnet and sapphire bearings.
- B. Pressure Gauge: Low internal volume spiral/helical coil bourdon tube with solid front and rear blowout plug. "C" tubes will not be accepted. Gauges to be tapped  $\frac{1}{4}$ " NPT back and bottom. Accuracy to be 2% over full range.
- C. Manufacturers
  - 1. Dwyer
  - 2. Trerice
  - 3. Orange Research
  - 4. Or approved equal

### **PART 3 - EXECUTION**

- 3.1 Provide local panel for mounting of duct thermometers located next to air handler which it serves. Locate panel so that length of capillary tubing is held to a minimum. Mount panel on kindorf fastened securely to structure. Thermometers to be provided in each system as follows:
  - A. Upstream of each heating coil bank. Range 0 – 100F
  - B. Downstream of each heating coil bank. Range 0 – 160F
  - C. Upstream of each cooling coil bank. Range 0 – 100F



- D. Downstream of each cooling coil bank. Range 0 – 100F
  - E. At each return air fan inlet. Range 0 – 100F
  - F. At each supply air fan discharge. Range 0 – 160F
  - G. At each supply air fan inlet. Range 0 – 160F
  - H. At each outside air intake. Range – 40 to 160F
  - I. Where shown on Contract Documents.
- 3.2** Provide pipe thermometers and thermometer wells in the inlet and outlet at each of the following locations:
- A. Heat exchanger. (both sides)
  - B. Chilled water coil.
  - C. Hot water coil.
  - D. Refrigeration machine evaporator and condenser.
  - E. Hot water boiler.
  - F. Where shown on the Contract Documents.
- 3.3** Test plugs to be provided at inlet and outlet of each water coil (including unit heaters, cabinet heaters, fan coil units, etc.).
- 3.4** Provide pressure gauges at the following locations:
- A. Upstream and downstream of all coils, strainers, controls valves and pumps, heat exchangers, refrigeration machines (evaporator condenser, hot water generator), steam boiler, cooling tower.
  - B. Chiller plant chilled water supply and return.
  - C. Secondary chilled water supply and return piping.
  - D. Hot water header leaving the boiler plant.
  - E. Where shown on contract drawings.
- 3.5** Provide differential pressure gauges piped and mounted at an observable location in the following locations:
- A. Chilled water headers serving individual secondary chilled water zones distribution.
  - B. Chilled water headers at chiller.



- C. Condenser water headers at chiller.
- 3.6** Provide air pressure gauges at the following locations.
- A. Upstream and downstream of all filter banks, coils.
- 3.7** Install recording instruments as described herein.
- A. Install instruments flush mounted on a 10 gauge steel display panel complete with supports and braces. Submit the entire panelboard and arrangement for approval prior to fabrication.
  - B. Locate measuring instruments at the point of measurement with a signal transmitted to receiving instruments, for indicating and recording, mounted on the display panel.
  - C. Furnish ink and one year's supply of charts for each recorder.

**END OF SECTION 23 05 19**



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**SECTION 23 05 23  
VALVES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

**1.2 DESCRIPTION**

- A. Provide valves in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Globe Valves.
- B. Y-Pattern Globe Valves.
- C. Non-Lubricated Plug Valves.
- D. Check Valves.
- E. Ball Valves.
- F. Butterfly Valves.
- G. Automatic Flow Control Valves.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Valve List: Figure numbers and catalog cuts of proposed valves.
- C. Product Data: Manufacturer's latest published data for materials, intended service and installation.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Valves and valve construction to be suitable for the pressure, temperature, and fluid quality of the service in which they are to be used.



- C. All valves to be in accordance with ANSI, AWWA, ASTM, MSS-SP-70 & 80 (Manufacturers Standardization Society), and ASME standards and specifications.
- D. Minimum test pressure for all valves to be 1.5 times maximum system working pressure unless noted otherwise.
- E. Provide butterfly valves suitable for dead end service and constructed of high quality industrial design.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Provide valves of the same manufacturer throughout where possible.
- B. Provide valves with manufacturer's name and pressure rating clearly marked on the outside of body.
- C. Provide valves suitable for connection to adjoining piping as specified for pipe joints.
- D. All valves to be full pipe size unless noted otherwise.
- E. Provide all valves used for future connection with lockable handles.

### **2.2 GLOBE VALVES**

- A. Use for throttling in steam and water systems.
- B. 2" and smaller valves bronze body and trim with rising stem, screwed bonnet with screwed ends for steel piping and sweated ends for copper piping.
- C. Globe valves to be suitable for repacking under pressure. Packing to be non-asbestos.
- D. Manufacturers
  - 1. Grinnell
  - 2. Crane
  - 3. Hammond
  - 4. Milwaukee
  - 5. Stockham
  - 6. Nibco
  - 7. Or approved equal.



### **2.3 Y-PATTERN GLOBE VALVES**

- A. Use for throttling in water service ½" to 12".
- B. Provide valves of Y-Pattern design suitable for water temperatures to 250°F. Provide valves with provision for connecting a portable differential pressure meter. Each meter connection to have pressure/temperature readout points.
- C. Construct valves up to 2" of pressure die cast nonporous copper alloy and 2½" and over of cast iron body and nonferrous copper alloy, with Teflon disc.
- D. Valves to be omnidirectional without affecting flow measurement and shall provide precise flow measurement, precision flow balancing, positive shut-off with no drip seat.
- E. Construct valves so that 4 full turns of handwheel provides maximum setting with hidden memory feature and tamper proof balancing setting.
- F. Manufacturers
  - 1. Tour & Anderson
  - 2. Armstrong
  - 3. Velan
  - 4. Or approved equal.

### **2.4 NON-LUBRICATED PLUG VALVES**

- A. Use for throttling in water service 2½" and larger.
- B. Provide valves of the non-lubricated bolted bonnet type with resilient faced plugs suitable for water systems to 250°F.
- C. Provide port area of valves through 20" at least 80% of full pipe area.
- D. Valve bodies of ASTM A126 Class B semi-steel with corrosion resistant seats of 90% nickel overlay.
- E. Furnish valves with replaceable, sleeve-type springs, washers, etc., zinc plated.
- F. Valves through 6" provided with an adjustable open position "memory stop" and level. Valves 8" and larger equipped with a totally enclosed worm and gear operator with handwheel and a "memory stop."

### **2.5 CHECK VALVES**

- A. Swing Type: Use for water and low pressure general services: 2" and smaller with screwed bonnet, screwed end for steel piping and sweated end for copper piping; 2½" and larger with bolted bonnet, flanged end. Valves to have renewable bronze seat and disc.



- B. Silent Type: Use on pumps with cycling control and larger than 2" discharge. Valves to have cast iron body with bronze or stainless steel trim and to be of the center guide type, with flanged end.
- C. Wafer Type: Provide wafer type check valves for use in pipe 24 inches diameter and larger. Check valves to be wafer type with steel body and discs, and flanged ends.
- D. Manufacturers
  - 1. Grinnell
  - 2. Crane
  - 3. Milwaukee
  - 4. Hammond
  - 5. Nibco
  - 6. Or approved equal.

## 2.6 BALL VALVES

- A. Use for stop, isolation and as drain valves, in water systems up to 200°F and pipe sizes to 3".
- B. Provide ball valves of the bronze top-entry body type, having a straight-through full port flow passage. Construction of valve to permit disassembly without removing body from line.
- C. Construct seats and all gland packing of Teflon. Lever handle to be vinyl covered. Body to be 2-piece screwed end for steel piping and sweated end for copper piping.
- D. Provide lever for quarter turn operation; lever to indicate open or closed position.
- E. When used as drain valves, provide with hose thread and brass cap with chain. Cap to be rated for full system pressure.
- F. Manufacturers
  - 1. Apollo
  - 2. Nibco
  - 3. Stockham
  - 4. DeZurik
  - 5. Or approved equal.



## **2.7 HIGH PERFORMANCE BALL VALVES**

- A. Use for stop, isolation and as drain valves, in water systems up to 400°F and pipe sizes to 3".
- B. Provide high performance ball valves of the stainless steel top-entry body type, having a straight-through full port flow passage. Construction of valve to permit disassembly without removing body from line. Body to be 2-piece screwed end.
- C. Shafts to be constructed of 316 stainless steel with stellite surfaced bearing areas. Shaft bearing to be ceramic filled TFE.
- D. Construct seats of stellite faced 316 stainless steel and all gland packing of ceramic filled multiple V-ring TFE.
- E. Provide lever for quarter turn operation; lever to be vinyl covered and indicate open or closed position.
- F. When used as drain valves, provide with hose thread and brass cap with chain. Cap to be rated for full system pressure.
- G. Manufacturers
  - 1. Apollo
  - 2. Nibco
  - 3. Stockham
  - 4. DeZurik
  - 5. Or approved equal.

## **2.8 BUTTERFLY VALVES**

- A. Use for stop and isolation in water systems up to 200°F and pipe sizes 2½" and larger.
- B. Butterfly valves to have ductile iron lug body, 316 stainless steel stem with bronze bushings and aluminum bronze disc.
- C. The stem journals will be a multiple seal design providing for completely independent seals. The stem disc assembly will be such that the need for pins, screws or bolts is not required. Positive stem retention to be provided to permit removal of handle or actuator while under full operating pressure.
- D. The valve seats to consist of replaceable resilient elastomer.
- E. Valves to size 6" to be supplied with multi-position handles; size 8" and over to be supplied with enclosed worm gear operator.



- F. Valve body to be full-lug pattern to comply with MSS-SP-67 and be compatible with ANSI pattern flanges of appropriate pressure rating.
- G. Manufacturers
  - 1. Bray
  - 2. Grinnell
  - 3. Jamesbury
  - 4. Centerline
  - 5. Keystone
  - 6. Nibco
  - 7. Or approved equal.

## **2.9 HIGH PERFORMANCE BUTTERFLY VALVES**

- A. Use for stop and isolation in water systems up to 400°F and pipe sizes 2½" and larger.
- B. Butterfly valves to have steel lug body, one piece 316 stainless steel stem with bronze bushings and 316 stainless disc with chrome plated seating edge. Drive end of shaft to be squared to provide positive actuator connection.
- C. The stem journals will be a multiple seal design providing for completely independent seals. Positive stem retention to be provided using solid type 316 stainless steel keys locked in place, to permit removal of handle or actuator while under full operating pressure.
- D. Construct discs with a concave face to reduce dynamic torque, decrease turbulence and maximize flow capacity.
- E. Provide disc-to-shaft pins of stainless steel and of the tangential or compressive type. Pins shall be subject to compression forces only, no shear forces.
- F. The valve seats to consist of replaceable PTFE seating surface with a titanium retaining ring.
- G. Shaft bearings to be of reinforced PTFE and thrust bearing to be a combination of reinforced PTFE with 316 stainless steel.
- H. Provide packing of multiple PTFE V-ring design with adjustable gland follower and 316 stainless gland.
- I. Valves to size 6" to be supplied with multi-position handles; size 8" and over to be supplied with enclosed worm gear operator.



- J. Valve body to be full-lug pattern to comply with MSS-SP-67 and be compatible with ANSI pattern flanges of appropriate pressure rating.
- K. Manufacturers
  - 1. DeZurik
  - 2. Flow Seal
  - 3. Contromatics
  - 4. Or approved equal.

## **2.10 AUTOMATIC FLOW CONTROL VALVES**

- A. Provide automatic pressure-compensating flow control valves with extended valve body and dual temperature/pressure test ports. Provide performance certification of valves by an independent laboratory to the Commissioner.
- B. Valve to be manufactured in one piece and to consist of ground joint union, flow control and test plugs.
- C. All valves to be factory set to control the flow rate within 4 percent of the selected rating over an operating pressure differential of at least 10 times the minimum required for full flow conditions.
- D. Valves to be brass and stainless steel with threaded or sweat connections.
- E. Provide all valves with unions to allow field exchange of internal components without removing the valve body from the pipeline.
- F. Mark all valves in a permanent manner to show direction of flow and flow rate.
- G. Provide valves rated for a minimum of 350 psi, or as necessary to meet the design conditions of the piping system.
- H. Provide test plugs with dual valve cores for pressure and temperature monitoring.
- I. Confirm the valve design flow rate by establishing that the pressure drop is within the valves' specified pressure range.
- J. Manufacturers
  - 1. Autoflow
  - 2. Griswold
  - 3. Bell & Gossett
  - 4. Or approved equal.



**2.11 VALVE LIST**

- A. The following is a listing of representative figure numbers by service, indicative of the product quality required.
- B. Water Services

Service	Type	Size	Nibco Fig. No. (Crane, Bray, Keystone or approved equal)	DeZurik Fig. No. (Crane, Bray, Keystone or approved equal)
Cellar and Above to 150 psi	Globe	1½ to 2 in.	T-235Y	-
	Globe	2½ to 10 in.	F-718B	-
	Plug	2½ to 24 in.	-	118
	H.P. Ball	To 2 in.	-	551
	H.P. Butterfly	2½ to 36 in.	-	BHP-L1
	Check-Swing	To 2 in.	T-433-B	-
	Check-Swing	2½ to 12 in.	F-918B	-
	Check-Silent	All	F/W 910/960	-

**PART 3 - EXECUTION**

**3.1 GENERAL**

- A. Install valves so that they are accessible for repacking.
- B. Install with stem vertical and handle up wherever possible, never with stem below horizontal position.
- C. Install with operating clearance for handle and stem.
- D. Install isolation valves on equipment so that valve and piping do not interfere with equipment removal or maintenance. Install unions or flanges on equipment side of valves.
- E. Provide 1" drain valves with threaded ends for hose connections at drain points, at main shutoff valves, low points of piping systems, bases of vertical risers, and at equipment.



- F. Provide required manual or automatic vent valves at high points of piping systems to facilitate venting of air and to ensure quiet operation.
- G. Provide renewable bronze seat rings and bronze spindles for cast iron body valves.
- H. Provide chain operated sheaves and chains for all valves which are more than 8 feet above the floor in Mechanical Equipment Rooms.
- I. Furnish and install other valves, check valves, cocks, etc., as required for the complete and proper valving of the entire installation.
- J. Install butterfly valves in horizontal piping with stem in the horizontal position so that bottom of disk lifts in the direction of flow.
- K. Install butterfly valves in vertical piping at pumps with stem perpendicular to pump shaft.

**END OF SECTION 23 05 23**



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**SECTION 23 05 29  
HANGERS, ANCHORS AND SUPPORTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide hangers, anchors and supports in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Hangers.
- B. Structure Attachments.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit details of pipe hangers, anchors and supports for each pipe size and pipe service. Submit details of support methods and point loadings, and anchor reactions.
- C. Product Data: Manufacturer's latest published data for materials, equipment and installation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Hangers and supports to be constructed and applied according to the following standards:
  - 1. Manufacturer's Standardization Society MSS SP-58, SP-69 and SP-89.
  - 2. Power Piping Code, ANSI B31-1.



**PART 2 - PRODUCTS**

- 2.1 Provide hangers of heavy construction suitable for the size of pipe to be supported. All materials to be of steel, except rollers which are to be of wrought or malleable iron. Hangers for pipes up to and including 5 inches to be adjustable swivel ring, split ring, wrought pipe clamp, or adjustable wrought clevis type. Hangers for pipes 6 inches and above to have 2 rods and cross-rod with cast iron pipe roll complete with adjustable sockets and nuts.
- 2.2 Support vertical piping with double bolt riser clamps attached to the pipe, resting on the floor slab. In general, use one clamp for each two floors and one clamp at each floor for copper tubing. Where pipes are in open shafts, provide forged steel bar brackets fixed to wall.
- 2.3 Support vertical piping risers on base elbow supports. Supports to be no less than one pipe size smaller than riser.
- 2.4 The following tables will establish a minimum level of acceptance for pipe hangers, supports and attachments. Figure numbers below are strictly for reference purposes. Grinnell (basis of design) figure numbers or comparable figure numbers by Pipe Shields Inc., C&S Manufacturing or approved equal are all acceptable.

A. Hangers and Supports

Service	Hanger Type	Basis of Design Figure No. (or approved equal see section 2.5)	Maximum Pipe Size
Uninsulated Steel	Clevis	260	5"
Uninsulated Copper	Clevis	CT-65	4"
All (Steel Pipe)	Riser Clamp	261	20"
(Copper Pipe)	Riser Clamp	CT-121	4"
All Insulated	Roller Hanger	171	24"
Chilled & Condenser Water	Base Plate & Roll	277	24"
Hot Water, Steam and Steam Condensate	Base Plate & Roll	274	24"
All	Trapeze	46	24"
All	Wall Bracket	195	5"
All	Wall Bracket	199	12"



B. Structure Attachments

Type	Basis of Design type Figure No. (or approved equal see section 2.5)	Maximum Rod Size (Inches)	Maximum Pipe Size
Beam Clamp	218	7/8	8"
Beam Clamp	228	1½	24"
Side Mount Clamp	225	7/8	8"
Channel Clamp	226	7/8	8"
Expansion Shield	281	7/8	8"

2.5 MANUFACTURERS

- A. Grinnell (Basis of Design)
- B. Pipe Shields Inc.
- C. C&S Manufacturing
- D. Or approved equal

PART 3 - EXECUTION

3.1 Support horizontal piping in accordance with the following schedule:

Pipe Size	Maximum Hanger Spacing	Rod Size
1" and smaller	6'-0"	3/8"
1¼" to 2"	9'-0"	3/8"
2½" to 3"	10'-0"	1/2"
4" to 5"	12'-0"	5/8"
6"	12'-0"	3/4"



Pipe Size	Maximum Hanger Spacing	Rod Size
8" to 12"	12'-0"	7/8"
14" to 16"	12'-0"	1"
18"	12'-0"	1-1/8"
20"	12'-0"	1-1/4"
24"	12'-0"	1-1/2"

- 3.2** Provide hangers at each change in direction and both sides of each valve.
- 3.3** Support hangers from concrete inserts or beam clamps. Furnish, locate and set such inserts and make sure that such inserts are in place when the concrete is poured. Construct inserts of malleable iron or pressed steel with space for rods of all sizes. Install all inserts for pipes 3" and larger in size with a reinforcing rod 5/8" in diameter run through a slot in the insert specifically provided for this purpose.
- 3.4** If any pipe is to be hung in a space where no inserts have been provided, drill holes in the slab (subject to the Commissioner's prior approval) and provide rods and hanger attached to an approved fishplate or install double expansion shields connected by a 2" x 2" angle, from which the hanger rod is to be suspended. For pipe size 2" and under, use single shields but the hanger spacing defined hereinbefore to be reduced to 5'-0". The carrying capacity and size of each shield to be calculated on the basis of the spacing indicated above but the minimum size to be 3/8". Install additional shields of the same size so that the number of hangers are of adequate size to support the loads which they carry. Shields may be used in concrete slabs only.
- 3.5** Regardless of the type of construction (i.e., concrete, concrete-deck-steel or other variations) take particular care to support all main lines and all large and heavy pipes in an approved manner, including the furnishing and installation of supplementary steel, if required. Supplementary steel sections are to be mill-rolled. Submit shop drawings, indicating support methods, point loadings to the building structure and hanger locations for review sufficiently in advance of concrete pouring schedules to permit evaluation, critique and any necessary changes to handling and support methods.
- 3.6** Set all inserts for all pipes in ample time to allow concrete work to be performed on scheduled time.
- 3.7** Hangers may be directly attached to steel beams of building construction, where they occur, if approved by Commissioner. Smaller pipes may be suspended from crosspieces of pipe or steel angles, which in turn, are to be securely fastened to building beams or hung from building concrete construction by means of rods and inserts. The intention is to provide supports which, in each case, will be amply strong and rigid for the load, but which will not weaken or unduly stress the building construction.
- 3.8** Provide approved roller support, floor stands, wall brackets, etc., for all lines running near the floor or near walls, which can be properly supported or suspended by the floors or walls. Pipelines near walls may also be hung by hangers carried from approved wall brackets at a level higher than the pipe.
- 3.9** Do not hang piping from other piping. Support of hangers by means of vertical expansion bolts is not permitted.

- 3.10 Wherever hangers using pipe rolls are used provide approved steel pipe covering protection saddles, spot welded to the piping at each hanger location. Vapor barrier jackets to cover shield.
- 3.11 Anchor piping where shown on Drawings and as required to localize expansion or to prevent undue strain on piping and branches. Anchors to be entirely separate from hangers. All anchor designs to be submitted for approval and to include piping reactions which respective anchors are capable of supporting. Provide all indicated or required expansion loops.
- 3.12 Support all lines of copper tubing individually by approved type hangers not more than 6' apart, or as shown on the drawings. Use hangers especially designed for copper tubing and of exact outside diameter of tubing. On hangers for covered tubing, use broad straps fitting outside of covering.
- 3.13 Hangers used for cold piping will support the pipe without piercing the insulation. Use insulation shields to protect the insulation on cold pipes. Weld insulation protection saddles to insulated hot pipes, or any piping subject to axial movement, at roller supports. Space between pipe and saddle to be filled with insulation. Wherever fibrous glass pipe insulation is installed, install calcium silicate of equal thickness in lieu thereof, wherever hangers and insulation shields bear on insulation. Vapor barrier jackets to cover shields.
- 3.14 For piping 4" and larger, support the elbows of the piping adjacent to the pumps with steel base elbow supports from the inertia base which pump is on to prevent loading heavy weights of piping on pump casing. Where inertia base is not provided, base elbows to be supported on floor with 1" neoprene pad.
- 3.15 Support risers using base elbow supports, no smaller than one pipe size, mounted on 1" neoprene pad and concrete housekeeping pad. Submit pipe loads to Commissioner for review.
- 3.16 **ATTACHMENTS TO EXISTING STEEL DECK SLAB**
- A. Attachments to existing steel deck to be limited to loads of 500 lbs. Heavier loads to be supported by supplementary structural steel connected to structural beams. Provide all required supplementary steel.
  - B. Attachments with loads only up to 500 lbs. is to be accomplished by drilled-in expansion shield type anchors located on the center line of the concrete filled ribs.
  - C. 500 lb. load attachments must not be spaced less than 5'-0" apart, and are to be located as close to steel beams as possible.
  - D. Furnish and locate sleeves, cut holes through deck, reinforce deck, and set sleeves. Coordinate sleeve locations with deck subcontractor and electrical distribution. Submit drawings showing location of holes and proposed reinforcing for approval before proceeding with installation.

**END OF SECTION 23 05 29**



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**SECTION 23 05 40  
ACOUSTICS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].
- B. Provide acoustical treatment in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Sound-Lining.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
1. Sound-Lining.
  2. Certification that sound-lining meets erosion test method described in U.L. Publication No. 181 erosion test method.
  3. Non-hardening caulking.
  4. Certified Tests:
    - a. Submit certified test data from approved laboratory for pressure drop and insertion loss ratings:
      - 1) For square or rectangular attenuators: 24 in. x 24 in. cross-section attenuator.
      - 2) Certification data for pressure drop and net insertion loss: based on tests of same attenuator.



- 3) Attenuators and tests: subject to inspection upon request.

#### 1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Acoustical Criteria

1. Noise levels, due to equipment and ductwork, to permit attaining sound pressure levels in all 8 octave bands in occupied spaces will conform to the following NC curves:
  - a. Lobbies, corridors, toilets, spaces within 10 feet of duct penetrations through walls and floors of fan rooms: NC-40.
  - b. Conference Rooms:
    - 1) Small: NC-35.
    - 2) Large: NC-30.
  - c. Offices: NC-30.
  - d. All other spaces: NC-35.
2. In addition to complying with the standard full octave band sound pressure levels based on NC criteria, acoustical performance of fans, air handling units, terminal devices, pressure regulating boxes, etc., when operating under design conditions shall not create any objectional pure tones. A pure-tone is defined as a peak sound pressure level which, when measured in 1/3 octave band frequencies, is higher by more than 5 dB's than adjacent 1/3 octave band frequencies.
3. Comply with specified NC levels for radiated noise from pressure regulating boxes and/or duct breakout noise from floor-by-floor air handling equipment by having full octave band sound pressure levels of at least two contiguous frequencies tangent to the NC spectrum. In other words, a single frequency controlled NC environment is considered obtrusive and unacceptable.

C. Mechanical Performance

1. Air distribution system equipment; terminal device noise:

- a. Maximum permissible sound-power levels in octave bands of airborne transmissions through the combination of grilles, registers, diffusers, and terminal units, or related pressure reducing devices, when operated in installed condition per Plans and Specifications is as follows:



Octave Bands	Maximum PWL re 10 <sup>-12</sup> Watts				
	NC-30	NC-35	NC-40	NC-45	NC-50
1	58	62	66	68	70
2	52	56	60	63	66
3	45	49	54	58	62
4	41	46	51	56	61
5	38	43	48	53	58
6	37	42	47	52	57
7	36	41	46	51	56
8	37	42	47	52	57

2. Pressure reducing boxes above ceiling; radiated noise:
  - a. Maximum permissible radiated sound-power levels in octave bands when operated in installed condition over occupied spaces, is as follows:

Octave Bands	Maximum PWL re 10 <sup>-12</sup> Watts			
	NC-35	NC-40	NC-45	NC-50
1	72	76	79	82
2	70	74	77	80
3	61	65	68	71
4	60	64	68	72
5	57	62	68	72
6	56	60	65	70
7	66	70	75	80
8	65	70	75	80

3. Provide sound-lining in accordance with U.L. 181.
4. Provide all materials in accordance with NFPA, U.L. and state and local codes.



## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

#### **A. Sound-Linings**

1. Fiber glass.
2. Facing for Low Pressure Duct Liner:
  - a. Finish: Neoprene coated.
  - b. Stenciled NFPA 90.
3. Facing for duct liner downstream of local floor equipment room walls for a distance of 15 feet, and all ducts with velocities over 2500 FPM.
  - a. Finish: Perforated, 28 percent minimum open area, 24 gauge galvanized steel.
4. Thickness:
  - a. In ductwork: minimum 1 in. unless otherwise noted on drawings.
  - b. In plenums and in supply duct downstream of local floor equipment rooms: minimum 2 inches, 3-pound density, semi-rigid.
  - c. For sound-lining used as thermal insulation minimum thickness shall conform to requirements as specified in Section on Insulation.
  - d. Linear Diffuser Supply Plenums: Minimum ½", 1½ lb. density.
5. Minimum density: 1½ lb. per cu. ft. in ducts. 3 lb. per cu. ft. in plenums.
6. Flamespread: Maximum 25.
7. Fuel Contributed and Smoke Developed: Maximum 50.
8. Suitable for duct velocity of 4000 fpm. Meet erosion test method described in U.L. Publication No. 181.
9. Dynamic Loss Coefficient: Maximum 1.2.
10. K Factor: Maximum .25 Btu/hr./°F/in.
11. ASTM Noise Reduction Coefficient (NRC) for 1-inch thick lining: minimum 0.70.



**B. Adhesive and Sealer**

1. Adhesive: Benjamin Foster 85-20, Certainteed, John-Manville or approved equal.
2. Sealer: Benjamin Foster 85-20, Certainteed, John-Manville or approved equal.

**C. Non-Hardening Caulking**

1. Guaranteed to be permanently elastic.
2. Polybutene type.

**2.2 MANUFACTURERS**

**A. Sound-Linings**

1. Certainteed Products Corp.
2. Johns-Manville Corp.
3. Owens-Corning Fiberglas Corp.
4. Or approved equal

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

**A. In order to obtain satisfactory acoustical performance of the terminal devices, complete the following:**

1. Proper duct connections at inlet to the terminals.
2. Proper air-balancing.
3. Avoid excessive dampering right at the terminals.

**B. Sound-Linings**

1. Adhere with 6 in. wide strips of adhesive.
  - a. 12 in. on centers.
  - b. At joints in lining.
2. In addition, secure with weld pins and 2 in. diameter washers on maximum 16 in. centers.
3. Coat all edges with sealer and caulk all butt joint seams.



4. Provide continuous sheetmetal edge protection at entering and leaving edges of lined duct sections and all joints.
5. Dimensions of lined ductwork are clear inside dimensions after lining has been installed.
6. Extent of Ductwork Sound-Linings:
  - a. Air-Conditioning Systems:
    - 1) Supply: Ductwork within mechanical equipment rooms not less than 25 feet from fan. Downstream of local floor MER walls.
    - 2) Return: Ductwork in mechanical equipment rooms but not less than 25 feet from fan.
  - b. Outside air supply systems a minimum distance of 25 feet downstream of fan.
  - c. Ventilation Systems: As indicated on Drawings.
  - d. Exhaust Systems: As indicated on Drawings.
  - e. Ductwork downstream of:
    - 1) Terminal Units: Minimum 10 feet or as per manufacturer's recommendations.
  - f. Minimum lengths shown. Provide additional acoustical treatment as required to meet maximum permissible sound-power levels scheduled for equipment.
7. Sound-Lined Plenums: As indicated on Drawings.
8. All transfer and jumper ducts.
9. All linear diffuser supply plenums.

**C. Soundproofing of Construction**

1. Required for packing between ductwork and the following construction:
  - a. Equipment room walls.
  - b. Floors, except in shafts.
  - c. Sound barrier ceilings.
2. Soundproofing:
  - a. Fill openings with fiber glass blanket or board for full depth of penetration.



- b. Caulk each side of opening with non-hardening, non-aging caulking compound: Johns-Manville "Duxeal", Certainteed, Owens Corning or approved equal.
  3. Soundproofing may be deleted when firestopping material is provided.
- D. Ductwall External Soundproofing
  1. Extent:
    - a. Vane axial fans including their inlet and discharge transitions and sound attenuators.
    - b. Where indicated on Drawings.
  2. Soundproofing Material:
    - a. Fiber Glass:
      - 1) Board: 6 lb./cu. ft. density.
      - 2) Thickness: ½ in. greater than height of ductwork angles, but 2 in. minimum.
    - b. External Jacket:
      - 1) Lead Sheet:
        - a) Overlapped 2 in.
        - b) Secured with tape.
        - c) Weight: 1 lb. per sq. ft.
        - d) Thickness: 1/64 inch.

**END OF SECTION 23 05 40**



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**SECTION 23 05 48  
VIBRATION ISOLATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide vibration isolation in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Vibration isolation elements for piping and equipment.
- B. Equipment isolation bases.
- C. Seismic restraints.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Manufacturer's Data
  - 1. Catalog cuts and data sheets on specific vibration isolators to be utilized showing compliance with the specifications.
  - 2. An itemized list showing the items of equipment or piping to be isolated, the isolator type of model number selected, isolator loading and deflection, and reference to specific drawings.
  - 3. An itemized list of non-isolated equipment, piping, and ductwork to be seismically restrained.
  - 4. Seismic restraint calculations.
  - 5. Written approval of the base design to be obtained from the equipment manufacturer.



C. Shop Drawings

1. Drawings showing equipment base constructions for each machine, including dimensions, structural member sizes and support point locations.
2. Drawings showing methods of suspension, support guides for piping and ductwork.
3. Drawings showing methods for isolation of pipes and ductwork piercing walls and floor slabs.
4. Concrete and steel details for bases including anchor bolt locations.
5. Number and location of seismic restraints and anchors for each piece of equipment and of ductwork and piping.
6. Specific details of restraints, including anchor bolts for mounting and maximum loading at each location for each piece of equipment and lengths of ductwork and piping.
7. Provide installation instructions, drawings and field supervision to assure proper installation and performance.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Provide control of excessive noise and vibration in the buildings due to the operation of machinery or equipment, and/or due to interconnected piping, ductwork or conduit. Installation of vibration isolation units, and associated hangers and bases, under the direct supervision of the vibration isolation manufacturer's representative.
  1. All vibration isolators shall have either known undeflected heights or calibration markings so that, after adjustment, when carrying their load, the deflection under load can be verified, thus determining that the load is within the proper range of the device and that the correct degree of vibration isolation is being provided according to the design.
  2. All isolators shall operate in the linear portion of their load versus deflection curve. Furnish load versus deflection curves linear over a deflection range of not less than 50% above the design deflection.
  3. The ratio of lateral to vertical stiffness to be not less than 0.9 nor greater than 1.5.
  4. The theoretical vertical natural frequency for each support point, based upon load per isolator and isolator stiffness shall not differ from the design objectives for the equipment as a whole by more than  $\pm 10\%$ .
  5. All neoprene mountings shall have a Shore hardness of 40 to 65, after minimum aging of 20 days or corresponding oven-aging.
- C. Adhere to SMACNA Guidelines for Seismic Restraints of Mechanical Systems.



- D. Adhere to ASHRAE Guide 1995 Chapter 50.
- E. Design seismic restraints in accordance with Local Code Seismic Zone applicable to New York City.
- F. Manufacturer of vibration isolation equipment has the following responsibilities:
  - 1. Determine vibration isolation and seismic restraint sizes and locations.
  - 2. Guarantee specified isolation system deflection.
  - 3. Provide piping and equipment isolation systems and seismic restraints as scheduled or specified.
  - 4. Provide installation instructions, drawings and field supervision to assure proper installation and performance.
- G. Engineer's stamp verifying design and calculations for seismic restraining systems used.
- H. Substitution of internally isolated mechanical equipment in lieu of the specified isolation of this Section must be approved for individual equipment units and is acceptable only if above acceleration loads are certified in writing by the equipment manufacturer and stamped and sealed by a licensed professional engineer in the State of New York.
- I. Purchased and/or fabricated equipment must be designed to safely accept external forces of 1.0g load in any direction for all rigidly and resiliently supported equipment, piping and ductwork without failure and permanent displacement of the equipment. Life safety equipment such as fire pumps, smoke exhaust fans, emergency generators and other life safety designated equipment must be capable of accepting external forces of up to 1.5g in any direction without permanent displacement or failure of the equipment.
- J. Vibration isolation firms having a minimum three years' experience designing and installing vibration isolation and seismic restraint systems shall be qualified to provide the materials and installation required by this section. Project listings shall be provided including geographical location and a reference contact.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. All vibration isolation devices to be the product of a single manufacturer.
- B. Where spring isolation systems are described in the following specifications, the mounting assemblies shall utilize bare springs with the spring diameter not less than 0.8 of the loaded operating height of the spring. Each spring isolator shall be designed and installed so that the ends of the springs remain parallel. The minimum deflection from loaded operating height to spring solid height shall be 50% of the rated static deflection of the spring.
- C. Where neoprene-in-shear isolation systems are described in the following specifications, the mounting assemblies shall utilize bare neoprene elements with unit type design molded in oil resistant neoprene. The neoprene shall be compounded to meet the following:



1. Shore hardness of 35 to 65  $\pm$ 5, after minimum aging of 20 days or corresponding oven-aging.
2. Minimum tensile strength of 2000 PSI.
3. Minimum elongation of 300%.
4. Maximum compression at 25% of original deflection.

D. All mounting systems, including seismic restraints, exposed to weather and other corrosive environments shall be protected with factory corrosion resistance. All metal parts of mountings (except springs and hardware) to be hot dip galvanized. Springs shall be cadmium plated and neoprene coated. Nuts and bolts shall be cadmium plated.

## 2.2 VIBRATION ISOLATORS

A. See manufacturers list below for all manufacturers approved. Basis of design for device models are indicated for reference only. Other manufacturers are acceptable.

1. Manufacturer abbreviations:
  - a. Mason Industries, Inc. (MII)
  - b. Vibration Mountings & Controls, Inc. (VMCI)
  - c. Vibration Eliminator Co. (VEC)

B. Refer to schedule sheets for vibration isolator types to be used.

1. Type A: Bare spring isolators to incorporate the following:
  - a. Minimum ¼ inch thick neoprene acoustical base pad on underside, unless designated otherwise.
  - b. Designed and installed so that ends of springs remain parallel.
  - c. Non-resonant with equipment forcing frequencies or support structure natural frequencies.
    - 1) Type SLF MII (Basis of Design)
    - 2) Type OSK VEC
    - 3) Type AN VMCI
    - 4) Or approved equal
2. Type B: Spring isolators to be same as Type A, except:
  - a. Provide built-in vertical limit stops with minimum ¼" clearance under normal operation.



- b. Tapped holes in top plate for bolting to equipment.
  - c. Capable of supporting equipment at a fixed elevation during equipment erection. Installed and operating heights shall be identical.
  - d. Shall incorporate snubbing restraint in all directions. Cast or aluminum housings are unacceptable. System to be field bolted or welded to deck with ability to resist forces of g acceleration.
    - 1) Type SLR MII (Basis of Design)
    - 2) Type KW VEC
    - 3) Type AWR VMCI
    - 4) Or approved equal
3. Type C: Spring hanger rod isolators to incorporate the following:
- a. Spring element seated on a steel washer within a neoprene cup incorporating a rod isolation bushing.
  - b. Steel retainer box encasing the spring and neoprene cup.
  - c. Provide sufficient clearance between retainer box and spring hanger rod to permit minimum 15 degree allowable rod misalignment in any direction, total 30 degrees.
  - d. Requires seismic restraint type III.
    - 1) Type 30N MII (Basis of Design)
    - 2) Type SNRC VEC
    - 3) Type RSH-30A VMCI
    - 4) Or approved equal
  - e. Where operating weight differs from installed weight provide built-in adjustable limit stops to prevent equipment rising when weight is removed. Stops shall not be in contact during normal operation.
4. Type D: Elastomer isolators to incorporate the following:
- a. Bolt holes for bolting to equipment base.
  - b. Bottom steel plates for bolting to sub-base as required.
  - c. Unit type design molded in oil-resistant neoprene.



- d. Encased in ductile steel or iron casing and capable of withstanding external forces of up to 1.0 g. System to be field bolted or welded to deck with ability to resist forces of 1.0 g.
  - 1) Type BR/RBA MII (Basis of Design)
  - 2) Type 368 SD VEC
  - 3) Type RD VMCI
  - 4) Or approved equal
5. Type E: Elastomer hanger rod isolators to incorporate the following:
  - a. Molded unit type neoprene element with projecting bushing lining rod clearance hole.
  - b. Neoprene element to be minimum 1 3/4" thick.
  - c. Steel retainer box encasing neoprene mounting.
  - d. Clearance between mounting hanger rod and neoprene bushing shall be minimum 1".
  - e. Requires seismic restraint type III.
    - 1) Type HD MII (Basis of Design)
    - 2) Type CD VEC
    - 3) Type RHD VMCI
    - 4) Or approved equal
6. Type F: Combination spring/elastomer hanger rod isolators to incorporate the following:
  - a. Spring and neoprene isolator elements in a steel box retainer.
  - b. Other characteristics of steel box retainer and hanger rod swing as described for Type C isolators.
  - c. Requires seismic restraint type III.
7. Type G: Pad type elastomer mountings to incorporate the following:
  - a. 0.750" minimum thickness.
  - b. 50 psi maximum loading.
  - c. Ribbed or waffled design.
  - d. .10" deflection per pad thickness.



- e. 1/16" galvanized steel plate between multiple layers of pad thickness.
  - f. Suitable bearing plate to distribute load.
  - g. Requires seismic restraint type II or III as installation requires.
    - 1) Type Super W MII (Basis of Design)
    - 2) Type 200N VEC
    - 3) Type Shearflex VMCI
    - 4) Or approved equal
8. Type H: Pad type elastomer mountings to incorporate the following:
- a. Laminated canvas duck material and neoprene.
  - b. Maximum loading 1000 psi.
  - c. Suitable bearing plate to distribute load.
  - d. Minimum thickness, 1/2 inch.
  - e. Requires seismic restraint type II or III as installation requires.
    - 1) Type HL MII (Basis of Design)
    - 2) Type T54 VEC
    - 3) Type Fabriflex VMCI
    - 4) Or approved equal

### 2.3 EQUIPMENT BASES

- A. See manufacturers list below for all manufacturers approved. Basis of design for device models are indicated for reference only. Other manufacturers are acceptable.
- B. Integral Structural Steel Base, Type B-1
  - 1. Reinforced as required to prevent base flexure at start-up and misalignment of drive and driven units. Centrifugal fan bases complete with motor slide rails. Drilled for drive and driven unit mounting template.
    - a. Type WF, M MII (Basis of Design)
    - b. Type SN VEC



- c. Type MPF VMCI
- d. Or approved equal

**C. Concrete Inertia Base, Type B-2**

1. Concrete inertia bases to be formed in a structural steel perimeter base, reinforced as required to prevent flexure, misalignment of drive and driven unit or stress transfer into equipment. The base to be complete with motor slide rails, pump base elbow supports and complete with height saving brackets, reinforcing, equipment bolting provisions and isolators.
2. Minimum thickness of the inertia base to be according to the following tabulation:

Motor Size (hp)	Minimum Thickness (in)
5-15	6
20-50	8
60-75	10
100-250	12
300-500	18

- a. Mason Type K, BMK (Basis of Design)
- b. VEC Type SN
- c. VMCI Type C
- d. Or approved equal

**D. Curb Mounted Base, Type B-3**

1. Curb mounted rooftop equipment shall be mounted on spring isolation curbs that directly sit on roof construction and are flashed and incorporated into roof's membrane waterproofing system.
2. All spring locations shall have removable waterproof covers to allow for spring adjustment and/or removal.
3. All spring mounts shall be as Isolator Type B.
4. Curb and spring mounting shall be capable of withstanding 110mph wind and 1.5g seismic loads.
5. Curbs shall be:



- a. Mason Type CMAB or RSC (depending on deflection required) - (Basis of Design)
  - b. VEC Type AR
  - c. VMCI Type E
  - d. Or approved equal
- E. Isolated Rail Base, type B-4
1. Rails shall be constructed from structural steel angles, as required, to prevent flexure and misalignment under load.
  2. Each rail shall be the full length of the supported equipment and be welded to a series of vertically restrained spring isolators as Type B described above.
  3. Angles shall have bolt-together ties at the ends and center to form one rigid base platform.
  4. Rail Base shall be:
    - a. Mason Type TRSLR (Basis of Design)
    - b. VEC Type SN
    - c. VMCI Type A
    - d. Or approved equal
- F. Vaneaxial Fan Built-Up Casing Floating Base, Type B-5
1. The vaneaxial fan casing, coils, filter assembly and inlet/discharge silencers shall be erected on top of a poured-in-place, reinforced concrete floating floor supported on Mason Industries Type EAFM 2" high mounting system, VEC Type 140, VMCI Type RVD or approved equal.
  2. The mountings shall be oriented in the floating floor base for the weight and weight distribution of the supported equipment (casing, coils, filter silencers) on the floating floor.
  3. The plywood form shall be Type AC exterior grade, ½" thick. Isolation mounts shall be 2" thick and shall be selected and oriented to provide deflections not exceeding 0.3" or 10 Hz frequency.
  4. The fans shall be resiliently spring supported, and as described elsewhere, from concrete piers erected from the structural slab and isolated from the floating floor.
  5. The design and installation of the vaneaxial fan built-up casing floating floor and fan isolation shall be coordinated with the vibration control vendor such that there will be no short circuit of the floating build-up casing base and the building structure.
  6. Requires seismic restraint type II.



## 2.4 FLEXIBLE CONNECTORS

- A. See manufacturers list below for all manufacturers approved. Basis of design for device models are indicated for reference only. Other manufacturers are acceptable.
- B. Elastomer Type FC-1
1. Manufactured of nylon tire cord and EPDM, both molded and cured with hydraulic presses.
  2. Straight connectors to have two spheres reinforced with a molded-in external ductile iron ring between spheres.
  3. Elbow shall be long radius reducing type.
  4. Rated 250 psi at 170°F. Dropping in a straight line to 170 psi at 250°F for sizes 1½" to 12" elbows. Elbows shall be rated no less than 90% of straight connections.
  5. Sizes 10" and 12" to employ control cables with neoprene end fittings isolated from anchor plates by means of ½" bridge bearing neoprene bushings.
  6. Minimum safety factor of 4 to 1 at maximum pressure ratings.
  7. Submittals to include test reports.
  8. Flex connector shall be:
    - a. Mason Types SuperFlex MFNEC, MFLRR, MFTFU, MFTNC, MFTCR (Basis of Design)
    - b. VEC Flexi
    - c. VMCI Type FK
    - d. Or approved equal
- C. Flexible Stainless Hose, Type FC-2
1. Braided flexible metal hose.
  2. 2 inch pipe size and smaller with male nipple fittings.
  3. 2½ inch and larger pipe size with fixed steel flanges.
  4. Suitable for operating pressure with 4:1 minimum safety factor.
  5. Length as shown on Drawings.
    - a. Type BSS MII (Basis of Design)



- b. Type MFP VMCI
- c. Type Flexi VEC
- d. Or approved equal

D. Unbraided Exhaust Hose, Type FC-3

- 1. Low pressure stainless steel annularly corrugated.
- 2. Fitted with flanged ends.
- 3. Maximum temperature 1500°F.
- 4. Hose shall be:
  - a. Mason Type SDL-RF (Basis of Design)
  - b. VMCI Type FK
  - c. VEC Type Flexible Hose
  - d. Or approved equal

**2.5 SEISMIC RESTRAINTS**

- A. See manufacturers list below for all manufacturers approved. Basis of design for device models are indicated for reference only. Other manufacturers are acceptable.
- B. General
  - 1. Provide restraints capable of safely accepting 1.0 "G" external forces without failure, or 1.5 "G" for life safety equipment to maintain equipment, piping, duct and fan powered boxes in a captive position. Restraints must not short circuit vibration isolation systems or transmit objectionable vibration or noise.
  - 2. Submit calculations by a licensed Professional Engineer licensed in the State of New York substantiating that all equipment mountings and foundations and their seismic restraints can safely accept external forces of 1.0g load for all rigidly and resiliently supported equipment, piping, and ductwork (1.5g load for all life safety equipment) without failure and permanent displacement. Restrain all resiliently mounted piping and ductwork with cable sway bracing.
- C. Seismic Restraint, Type I
  - 1. Comply with general characteristics of spring isolators.
  - 2. Provide vertical restraints that are capable of supporting equipment at fixed elevation during equipment erection.



3. Incorporate seismic snubbing restraint in all directions at specified acceleration loadings.
4. System to be field bolted to structure with minimum capability to withstand external forces of 1.5g.
5. Types:
  - a. Mason Type SSLF (Basis of Design)
  - b. VMCI Type HTR
  - c. VEC Type SB
  - d. Or approved equal

**D. Seismic Restraint, Type II**

1. Each corner or side seismic restraint shall incorporate minimum 1" thick pad limit stops. Restraints shall be made of plate, structural members or square metal tubing in a welded assembly, incorporating resilient pads. Angle bumpers are not acceptable. System to be field bolted to deck with 1.5g acceleration capacity.
2. Seismic spring mountings as described above are an acceptable alternative providing all seismic loading requirements are met.
3. Types:
  - a. Mason Type Type Z-1011, Type Z-1225 (Basis of Design)
  - b. VMCI Type HTR
  - c. VEC Type SB
  - d. Or approved equal

**E. Seismic Restraint, Type III**

1. Metal cable type with approved end fastening devices to equipment and structure. System to be field bolted to deck or overhead structural members or deck with aircraft cable and clamps as per SMACNA guidelines.

**2.6 MANUFACTURERS**

- A. Mason Industries, Inc. (MII)
- B. Vibration Mountings & Controls, Inc. (VMCI)
- C. Peabody Engineering (PE)



- D. Korfund Dynamics Corp. (KDC)
- E. Amber-Booth (AB)
- F. Vibration Eliminator Co. (VEC)
- G. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.
- B. Install in accordance with manufacturer's written instructions. Vibration isolators must not cause any change of position of equipment or piping resulting in piping stresses or misalignment.
- C. Isolate mechanical equipment from the building structure by means of noise and vibration isolators as scheduled on the Drawings and in these specifications.
- D. Piping and ductwork to be isolated must pass freely through walls and floors without rigid connections. Maintain 3/4 inch to 1 1/4 inch clearance around outside surfaces of piping or ductwork at penetration points. Pack this clearance space tightly with fiberglass, and caulk airtight after installation of piping or ductwork.
- E. Make no rigid connections between equipment and building structure that degrades the noise and vibration isolation system specified herein.
- F. Loop electrical circuit connections to isolated equipment to allow free motion.
- G. Bring to the Commissioner's attention prior to installation any conflicts with other trades which will result in unavoidable rigid contact with equipment or piping as described herein, due to inadequate space or other unforeseen conditions. Corrective work necessitated by conflicts after installation will be at the responsible contractor's expense.
- H. Support vertical piping loads, including water strainers, and valves between pump base elbow supports and the suction and discharge header piping by means of the pump base spring isolators without stress or strain to the pump housing.
- I. Do not install any equipment, piping or conduit which makes rigid contact with the "building" unless permitted in this Specification. Building includes, but is not limited to, slabs, beams, columns, studs and walls.
- J. Coordinate work with other trades to avoid rigid contact with the building. Inform other trades following work, such as plastering or electrical, to avoid any contact which would reduce the vibration isolation.



### 3.2 EQUIPMENT ISOLATORS

- A. Mount floor mounted equipment on 4" high concrete housekeeping pads over complete floor area of equipment. Mount vibration isolating devices and related inertia blocks on concrete pad. Key housekeeping pads with hair pins, as required, to be integral with structural slab. Provide approved seismic restraint anchor plates flush with top of housekeeping pad.
- B. Support each fan and motor assembly on a single structural steel frame. Provide flexible duct connections at inlet and discharge of fans.
- C. Provide brackets to accommodate the isolator. Manufacturer to specify the vertical position and size of the bracket.
- D. Maintain a minimum operating clearance between the equipment frame on rigid steel base frame and the housekeeping pad of 1 inch. Maintain a minimum operating clearance between concrete inertia and base and housekeeping pad or floor of 2 inches.
- E. Temporarily support the structural steel or concrete inertia base with blocks or shims, as appropriate, prior to the installation of the machine or isolators.
- F. Install the isolators without raising the machine and frame assembly.
- G. Adjust the isolator after the entire installation is complete and under full operational load so that the load is transferred from the blocks to the isolator. When all isolators are properly adjusted, the blocks or shims will be barely free and shall be removed.
- H. Verify that all insulated isolator and mounting systems permit equipment motion in all directions. Adjust or provide additional resilient restraints to flexibly limit equipment start-up lateral motion to ½ inch.
- I. Prior to start-up, clean out all foreign matter between bases and equipment. Verify that there are no isolation short circuits in the base or isolators.

### 3.3 ADDITIONAL REQUIREMENTS

- A. Diagonal thrust restraint shall be as described for Type C hanger with the same deflection as specified for the spring mountings. The spring element shall be designed so it can be pre-set for thrust and adjusted to allow for a maximum of ¼" movement at start and stop. Diagonal restraints shall be attached at the centerline of thrust.
- B. All piping and ductwork to be isolated shall freely pass through walls and floors without rigid connections. Penetration points shall be sleeved or otherwise formed to allow passage of piping or ductwork, and maintain ¾" to 1¼" clearance around the outside surfaces. This clearance space shall be tightly packed with fiberglass, and caulked airtight after installation of piping or ductwork.
- C. All HVAC piping vertical risers larger than 2" in diameter shall be isolated from the building structure by means of noise and vibration isolation guides and supports.



- D. Isolators shall be installed with the isolator hanger box attached to, or hung as close as possible to, the structure. Hanger rods shall be aligned to clear the hanger box.
- E. Isolators shall be suspended from substantial structural members, not from slab diaphragm unless specifically permitted.
- F. Structural steel for cooling tower or other equipment must support the equipment without excessive deflection. The structural steel support shall not be resonant with the isolation system resonant frequencies or the driving frequencies of the supported equipment.

### **3.4 PIPING, BOILER BREECHING AND ENGINE EXHAUST ISOLATORS**

- A. All piping, boiler breeching and engine exhaust, except fire standpipe systems, are included under this Section.
- B. Installation:
  - 1. Isolate piping, boiler breeching and engine exhaust outside of shafts as follows: All water, steam and glycol piping, boiler breeching and engine exhaust in machine rooms. Piping where exposed on roof. Water piping, boiler breeching and engine exhaust within 50 ft., or 100 diameters if greater than 50 ft. from connected rotating equipment and pressure reducing stations. All other piping shall be rigidly supported and provided with approved seismic restraints to maintain the piping in a captive position without excessive motion.
  - 2. All piping 2" and over located in mechanical equipment rooms, and for a minimum of fifty (50) feet or 100 pipe diameters, whichever is greater, from connection to vibrating mechanical or electrical equipment, shall be isolated from the building structure by means of noise and vibration isolation hangers, Type F.
  - 3. Horizontal suspended pipe 2" and smaller and all steam piping shall be suspended by Type E isolator with a minimum 1" deflection. Water pipe larger than 2" shall be supported by Type F isolator with a minimum 1", or same static deflection as isolated equipment to which pipe connects, whichever is greater.
  - 4. Horizontal pipe floor supported at slab shall be supported via Type B, with a minimum static deflection of 1" or same deflection as isolated equipment to which pipe connects, whichever is the greater.
  - 5. Vertical riser pipe supports shall utilize Type H.
  - 6. Vertical riser guides shall be installed to avoid direct contact of piping with building.
  - 7. Pipe anchors, where required, shall utilize resilient pipe anchors to avoid direct contact of piping with building.
  - 8. Pipe sway braces, where required, shall utilize two (2) neoprene elements (Type G or H to accommodate tension and compression forces).



9. Pipe extension and alignment connectors: Provide connectors at riser takeoffs, cooling and heating coils, and elsewhere as required, to accommodate thermal expansion and misalignment.
10. Adjust, as required, all isolators to eliminate all contact of the isolated rod with the hanger rod box retainer or short circuiting of the spring.

### **3.5 GENERAL SEISMIC RESTRAINT REQUIREMENTS**

- A. All equipment whether isolated or not shall be bolted to structure to allow for minimum 1.0g of acceleration (1.5g for life safety equipment). Bolt points and diameter of inserts shall be submitted and verified as part of the contractor's submission for each piece of equipment and stamped and sealed by a professional engineer licensed by the State of New York.
- B. All suspended equipment, whether isolated or not, shall be seismically restrained at four points with Type III cable restraints.
- C. Install seismic restraining system Type III taut for overhead suspended unisolated equipment, piping or ductwork, and slack with ½" cable deflection for isolated systems.
- D. Seismically restrain all piping and ductwork with center bracing or Type III restraining system in accordance with SMACNA guidelines outlined below:
  1. All schedule 10, 20, or 40 piping shall be welded or laterally braced at 40 foot intervals and at turns of more than 4 feet. Longitudinally bracing shall be supplied at 80 foot intervals. No-hub piping shall be braced at 10 foot intervals or at 40 foot intervals if 1.0g rated couplings are used.
  2. Ductwork to be braced every 30 feet (9m) and at every turn and duct run ends. Longitudinal bracing to be provided at 60 foot intervals.
- E. Seismic restraints are not required for the following:
  1. Gas piping less than 1" internal diameter.
  2. Piping in boiler and MER room that is less than 1¼" internal diameter.
  3. All other piping and electrical conduit less than 2½" internal diameter.
  4. All rectangular ducts less than 6 sq. ft. in cross sectional area.
  5. All round ducts less than 28" in diameter.
  6. All piping suspended by individual hangers 12" in length or less from the point of the attachment to the duct to the bottom of the support for the hanger.
  7. All ducts suspended by hangers 12" or less in length from the point of the attachment to the duct to the bottom of the support for the hanger.



- F. Chimneys and stacks passing through floors are to be bolted at each floor level or secured above and below each floor with riser clamps or approved vibration isolation systems with seismic restraints.
- G. Chimneys and stacks running horizontally to be braced every 30 ft. with Type III restraining system.
- H. Where base anchoring is insufficient to resist seismic forces, supplementary restraining such as seismic restraint system Type III shall be used above system's center of gravity to suitably resist 'g' force levels. Vertically mounted tanks may require this additional restraint.
- I. For overhead supported equipment, overstress of the building structure must not occur. Bracing may occur from:
  - 1. flanges of structural beams;
  - 2. upper or lower truss chords in bar joist construction at the panel points;
  - 3. cast-in-place inserts or drilled and shielded inserts in concrete structures.
- J. Each seismic restraint and snubbing device shall be installed after equipment is installed and fully operational. Each isolation mounting incorporating seismic restraint shall be adjusted to provide the minimum operating clearance in all directions to permit the operation of the equipment without objectional noise or vibration to any part of the building structure. The operating clearance for equipment seismic restraints shall not be greater than 1/4" (6mm). Seismic restraints must not result in short-circuiting of isolated equipment.

### **3.6 INSPECTION**

- A. On completion of installation of all vibration isolation and seismic restraint devices herein specified, the local representative of the isolation materials manufacturer shall inspect the complete system and report in writing any installation errors, improperly selected isolation or restraint devices, or other faults that could affect the performance of the system. Contractor shall submit a report to the Commissioner, including the manufacturer's representatives' final report, indicating all isolation reported as properly installed or requiring correction, and include a report by the Contractor on steps taken to properly complete the isolation work.

**END OF SECTION 23 05 48**



**Department of  
Design and  
Construction**

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**SECTION 23 05 53  
SYSTEMS IDENTIFICATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide systems identification in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Valve Tags.
- B. Piping Identification.
- C. Equipment Identification.
- D. Duct Identification.
- E. Charts and Schedules.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit valve tag chart; pipe, duct and equipment labels, paint and color chart.
- C. Product Data: Manufacturer's latest published data for materials, equipment and installation, including samples of valve tags, equipment identification and piping identification, showing size of lettering.
- D. Maintenance Manuals: Provide valve tag charts for inclusion in maintenance manuals.



#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Piping identification to be in accordance with ANSI A 13.1 - 1996 (latest edition) as to sizes, color, lettering and background color.

### **PART 2 - PRODUCTS**

#### **2.1 VALVE TAGS**

- A. Use tags 2 inch minimum diameter, fabricated of brass, stainless steel, aluminum or shatterproof plastic. Attach tags with chain, S-hook or split ring as appropriate.

#### **2.2 PIPING IDENTIFICATION**

- A. Provide color coded bands for all piping systems per ANSI-A 13.1-1996.
- B. Adhesive bands to be suitable for indoor use and quick-apply mechanically affixed markers for outdoors use

#### **2.3 EQUIPMENT IDENTIFICATION**

- A. Identify mechanical equipment by means of nameplates permanently attached to the equipment. Provide black surface, white core laminated bakelite with engraved letters. Minimum size plates 3" long by 1" wide with white letters 3/8" high. Fan powered terminals do not require nameplates.
- B. Identification of Automatic Controls to be as per Automatic Temperature Control specification.

#### **2.4 DUCT IDENTIFICATION**

- A. Stencil system number and service (supply, return, exhaust) onto ducts at strategic locations. Provide arrows to show direction of flow.

#### **2.5 CHARTS & SCHEDULES**

- A. Provide two diagrammatic charts of all piping systems showing location, numbers and types of all valves, framed for mounting. Legend to show service (steam, chilled water, etc.) and valve number. Assign numbers by floor.

#### **2.6 MANUFACTURERS**

- A. W.H. Brady
- B. Seton
- C. Marking Services Inc.



- D. Metalcraft Inc.
- E. Craftmark Inc.
- F. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 PIPING SYSTEMS**

- A. Identify all piping systems with color coded bands per ANSI A13.1-1996, sharply contrasting with background. Locate bands near strategic points, such as valves, items of equipment, changes in direction, wall penetrations, capped stub out for future connection and every 40 feet of straight runs. If necessary, paint a strip background of black or white to obtain contrast.
- B. Each set of bands to consist of one (1) band on which the name of the service is printed in black letters not less than 1½" high, and two (2) bands on which is printed a black directional arrow located on each side of legend. Apply bands where they can be easily read and with their long dimension parallel to the axis of the pipe. Provide bands with backgrounds of different colors from the various service groups.
- C. All valves shall be properly tagged.
- D. Provide three schedules of all valves showing number, size, type and service of each valve, suitable for use with three ring binder. Provide separate list for each system.
- E. Drain piping serving mechanical equipment items for which the drain discharge is not visible from the equipment shall be marked in accordance with ANSI 13.1-1996 near the point of discharge indicating the item of equipment served.

#### **3.2 EQUIPMENT**

- A. Attach nameplates in a permanent manner in a location that will be clearly visible after installation is complete.
- B. Mask all labels prior to field painting of equipment. Labels that are painted over will be replaced by Contractor at no cost to the City of New York.

#### **3.3 DUCTWORK**

- A. Stenciling to be done after insulation and other duct coverings are completed.
- B. Systems on which duct identification has been covered or is otherwise not visible will not be accepted.



**3.4 CHARTS & SCHEDULES**

- A. Prepare valve charts in a framed mounting behind a clear covering, such as glass, for protection.
- B. All identifying numbers will correspond to those numbers as shown on Contract Documents, such as riser numbers, equipment numbering, piping and duct symbols, etc.

**END OF SECTION 23 05 53**



**SECTION 23 05 93  
TESTING, ADJUSTING AND BALANCING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide testing, adjustment and balancing for all water and air systems in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Pressure testing of new piping and new duct systems.
- B. Preliminary and final adjustment of all new water systems.
- C. Preliminary and final adjustment of all new air systems.
- D. Verification of required air and water quantities from existing and new systems, if applicable.
- E. Temporary pipe and duct connections, pipe caps, duct caps, tees, valves, dampers, etc. TAB subcontractor to coordinate with mechanical subcontractor.
- F. Performance testing of all HVAC systems.
- G. This section covers general duct, pipe and equipment testing. Additional specific equipment tests are covered in individual sections.
- H. Operation of mechanical systems as required for testing by other trades.
- I. Cooperate with independent agent performing controlled inspections and/or commissioning.
- J. Refer to commissioning specifications for additional scope.



### 1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit the following prior to the execution of testing during the shop drawing phase:
  - 1. Complete brochure of proposed independent certified balancing firm, listing previous installations successfully balanced; length of time in business, names and qualifications of employees who will be assigned to the project, and list of instruments, equipment and elapsed time schedule to be used on the project.
  - 2. Procedures and recording forms for testing and adjusting each system and each item of equipment.
  - 3. Documentation of instrumentation calibration including date of calibration.
  - 4. Complete test and balancing plan listing all TAB procedures. For air and water systems the test and balancing plan submitted must be customized and reflect the actual systems within the project.
- C. Submit the following within two (2) weeks of completion of testing and adjusting.
  - 1. Submit six (6) certified copies of each complete testing and adjustment report to the Commissioner for review and send two (2) copies of the report to the City of New York. The Contractor shall submit individual testing and adjustment reports for each individual air distribution system, each return and exhaust system, and each pumping system within two (2) weeks after completion of the testing and adjustment of each system.
- D. Inspection Reports: List all system deficiencies found.
- E. Submit a statement of compliance or non-compliance with this specification section.

### 1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Testing
  - 1. SMACNA - 2002 Testing, Adjusting and Balancing.
  - 2. ANSI/ASME B31.9 - 2008; Chapter VI Part 937.
  - 3. ANSI/ASME B31.1 - 2010; Power Piping Code.
- C. Balancing
  - 1. AABC 2002 National Standards; Air and Hydronic.
  - 2. NEBB 2005 Edition of the Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.



3. SMACNA - 2002 Testing, Adjusting and Balancing.
- D. During the progress of the work, make tests as specified herein and as required by the Inspection Department, City of New York, or Commissioner. Tests shall be conducted by the Mechanical Subcontractor as part of the work of this Division. Include all qualified personnel, equipment apparatus, and services required to perform the tests.
- E. Calibrate all instruments used for testing and adjusting within a period of six (6) months prior to testing and/or balancing.

## **PART 2 - PRODUCTS**

### **2.1 PRESSURE AND TEMPERATURE SENSING TAPS**

- A. Confirm test plugs are available and operational for use on all existing equipment. If test plugs do not exist, provide and install ½-inch pressure and temperature test plugs on the entering and leaving piping at all equipment and as indicated on the plans in order to complete the required system balancing. Coordinate with the mechanical subcontractor during the installation phase. Provide and install any required test plugs in an acceptable manner and when necessary submit proposed installation location/method details to the Commissioner for review and approval.

## **PART 3 - EXECUTION**

### **3.1 TESTING**

- A. General
  1. Provide a complete set of approved mechanical and electrical shop drawings and equipment and product submittals to the balancing subcontractor.
  2. All testing and balancing work shall be performed on sections of ductwork and piping associated with the scope of work. Areas of work included, but are not limited to, new ductwork and piping sections, valves, sensors, etc.
  3. The Contractor shall balance all air and water systems part of the scope to values indicated on the documents by use of the existing devices (e.g. dampers, balancing valves, etc.). If during this process is found that the existing devices are damaged or inoperable, the Contractor shall inform the commissioner and replace the existing devices with approved devices or equal type.
  4. Perform all tests required as specified herein, as well as demonstrations of operation for all equipment. Each final test to be witnessed by the commissioner. Give a minimum of seven (7) days written notice before performing tests.
  5. Install all temporary and permanent equipment and instruments required for tests, as well as additional thermometer wells, gauge and instrument connections, at no additional cost to the City of New York.
  6. Perform preliminary tests and repair all leaks before notifying the City of New York of final tests.



7. Repair leaks, damage, or defects discovered during or resulting from tests or replace to a like-new condition. Remove leaky pipe joints, ductwork, etc., and replace with acceptable materials. Retest systems repaired.
8. Maintain a log book of all tests, preliminary and final, showing dates, personnel, observers' initials, description of test, and test status. Provide updated log to commissioner each month throughout the construction period. Initial log submitted to include listing of all anticipated tests.
9. Testing, balancing, and adjusting will not relieve the Contractor of the warranty requirements.
10. Furnish all fuel, water, and electricity required in performing the testing, balancing and adjustment of mechanical systems.
11. Clean all piping and ducts before testing.
12. Use calibrated test gauges with at least 4½" diameter dial. Gauge range not to be more than three (3) times test pressure.
13. Provide and demonstrate operation of all test equipment and apparatus required for the complete testing and inspection of all systems at such time and locations as may be directed by the Commissioner.
14. When freezing is a hazard, take all precautions necessary to prevent damage. Correct any and all damage that results due to freezing at no expense to the City of New York.
15. All tests shall be successfully completed and approved prior to the application of insulation and prior to the concealment of any portion of the system being tested.

**B. Piping**

1. Before covering or enclosing piping of various systems, all piping must be tested tight for 4 hours. Start and coordinate testing to be completed by close of business on the day started. The maximum test pressure not to exceed 500 psig. Tests may be witnessed by the Commissioner if he so desires, and pronounced satisfactory before pressure is removed.
2. Equipment must be valved off during the test. Do not pressure test through new equipment if equipment pressure ratings cannot support the test pressure. Drain equipment and piping and protect against freeze-up anytime the ambient temperature is below freezing.
3. Mix water for each hydrostatic test with ferrous corrosion inhibitor to a ratio of fifty (50) gallons of chemical to 10,000 gallons of water, or a higher concentration if recommended by the chemical manufacturer. At least sixty (60) days prior to the start of hydrostatic leak testing, submit a two (2) foot long length of the typical piping installed on the project to Nalco, Dow Chemical, DuPont or approved equal chemical manufacturer acceptable to the City of New York, to determine the composition of the internal pipe coating. Provide injection pumps, water meters and coupon racks to control and monitor the concentration. After leak testing and a sufficient time period to allow the interior of the piping to be chemically coated to prevent rust formation, drain the piping system until empty.
4. Test piping within conduit prior to encasement of joints.



5. Hydrostatically test water piping at 1.5 times actual maximum working pressure.
6. Hydrostatically test steam and condensate piping (less than 90 psig) for eight (8) hours at 150 psig.
7. Hydrostatically test steam and condensate piping (over 90 psig) for eight (4) hours at 1.5 times maximum working pressure.
8. In New York City all steam piping above 15 psig shall have welded joints 100% radiographed.
9. For all steam piping above 15 psig outside of New York City, provide radiographic examination of 10% of all high-pressure steam welds. City of New York to select welds to be tested. If any welds fail, test all other welds as directed by the commissioner at no cost to the City of New York.
10. Compressed Air Piping: Air test at 125% of relief valve setting of compressor but not exceeding 150 psig for four (4) hours.

C. Ductwork

1. Maximum system leakage shall not exceed 10% of system design capacity. When testing individual segments of a total system, prorate allowable leakage as follows:

$$\text{Maximum Leakage} = \frac{(\text{Surface Area of Test Section}) \times (.1) \times (\text{System CFM})}{(\text{Surface Area of System})}$$

- a. Test recording form to include above calculation. When all sections of a system have been tested, submit confirmation that the sum of individual section surface areas is equal to the total system surface area.
2. Pressure tests shall be performed with a test blower. Rig with orifice plate. Test ducts/casings with positive pressure on the discharge side of the system fan and under negative pressure on the suction side of the system fan. Include testing of flexible runouts.
3. During construction, individually test each completed riser, each completed horizontal distribution section and each field erected casing/plenum, as required below.
4. Test ductwork as follows:
  - a. Low Pressure Ductwork (From -2 to +2 inches H<sub>2</sub>O inclusive):
    - 1) Exposed or Accessible: Visual and audible check for leaks that can be heard or felt under normal operating conditions.
    - 2) Concealed (i.e., within shafts and above sheetrock ceilings): Pressure test at 2 inches H<sub>2</sub>O (pos. or neg. as required).
  - b. Medium Pressure Ductwork (Below -2 inches and above +2 inches H<sub>2</sub>O): Pressure test at system pressure classification.



**D. Equipment and Systems**

1. When each mechanical system is complete and functional, prove the capacity and performance of each item of equipment (i.e., fans, pumps, chillers, cooling towers, boilers, heat exchangers, etc.). Operate each item of equipment for a minimum of four (4) hours and record all associated operating data every 15 minutes (i.e., temperatures, flows, pressures, amps, volts, etc.). Verify all integral and external equipment controls and safeties are in proper working order. Complete system testing and demonstration to be done for both normal and emergency modes of operation. Commissioner, including Commissioning Agent, may witness final tests.
2. Demonstrate to commissioner, the proper operation of each control, monitor and alarm function of the control system, along with all software routines. Demonstrate these functions and routines from the front end and local panels under both normal and emergency power. Verify proper operation of battery back-up and downloading of software from the front end to the remote microprocessor panels.
3. Provide operation of all mechanical equipment required for systems testing by other trades (i.e., fuel oil systems, smoke exhaust systems, etc.).

**3.2 ADJUSTMENT**

**A. General**

1. Prior to start of air balancing, take traverse readings at all connections to building systems with all downstream dampers and other devices in fully open position and report results to Commissioner. Provide assistance if air quantities are below that shown on drawings.
2. Prior to start of water balancing, take ultrasonic flow readings at all connections to building systems with all downstream valves in full flow position and report results to Commissioner. Provide assistance if water quantities are below that shown on drawings.
3. After the entire installation has been completed, make required adjustments to balance valves, air vents, automatic controls, pumps, air dampers, air distribution devices, pressure reducing valves, fans, sheaves, etc., until performance requirements are met. Make these adjustments with equipment operating. In addition, repeat these adjustments for each of the remaining three seasons of the year. During such periods of adjustment prior to the date of substantial completion of the mechanical systems, operate equipment.
4. Permanently mark the balanced position of each balancing valve and damper on the pipe or duct or insulation.
5. Confirm all minimum and maximum air flow set points of all VAV boxes within the scope of the project. Document and provide to the Commissioner for record and review.



**B. Water Balancing**

1. Before any hydronic balancing work is done, contractor shall clean all existing strainers associated with the scope of work, check proper pump rotation, proper control valve installation and operation. Verify that each system is adequately bled and vented, proper system static pressure is available to assure a full system, flow meter and check valve is properly installed. Maintain throttling devices and control valves open at this time as required and appropriate.
2. After piping systems have been installed, tested, cleaned and flushed, complete with all pumps, piping, valves, coils, and other items as herein specified, make adjustments as required to deliver the water volumes at each coil and piece of equipment to within 10% of design flow as shown on the Drawings, or as required to properly balance the load throughout the conditioned areas. During balancing set control for full-flow through coils. Set automatic throttling valves in the full-open position. Close the bypass port on automatic 3-way valves. Confirm proper differential pressure settings at system by-pass station.
3. Each air handling unit with multiple coils shall have the flow through each coil balanced. Make adjustments in water volumes in a manner satisfactory to the Commissioner. Submit detailed balancing procedure and recording forms for the Commissioner's review months prior to commencing any water balancing work.
4. After water flow is adjusted, and with the temperature controls set to produce design cooling, measure and record all data necessary to compile a complete report to demonstrate the acceptability of the various mechanical systems.
5. Record the following design requirements for pumps and pump motors from the design drawings and reviewed shop drawings:
  - a. Manufacturer, model and size.
  - b. Water quantity - gallons per minute.
  - c. Total head - feet of water.
  - d. Pump speed - revolutions per minute.
  - e. Impeller size.
  - f. Net positive suction head.
  - g. Motor horsepower and brake horsepower.
  - h. Volts, hertz, amperes and service factor at design conditions.
6. Record the following data from pumps and pump motors installed at the project:
  - a. Manufacturer, model and size.
  - b. Impeller size.



- c. Motor horsepower, service factor and revolutions per minute.
  - d. Volts, hertz and full load amperes.
  - e. Motor starter and heater size.
  - f. Equipment location.
7. Record the following data for pumps and pump motors installed at the project:
- a. Pump speed - revolutions per minute.
  - b. Total head at shutoff or dead-end discharge feet of water. (Plot this value on pump curve as a verification of impeller size.)
  - c. Suction, discharge and total head at final adjusted flow - in feet of water.
  - d. Calculate brake horsepower and show on pump curve.
  - e. Motor amperage and voltage on each phase at operating conditions.
8. Adjust flow through equipment and coils by means of pressure drop. Obtain curves from the various manufacturers indicating the relationship between flow and pressure drop through the coils and equipment. Take readings on calibrated test gauges.
9. For orifice plates record the pipe size, orifice size, flow factor, required differential pressure, final differential pressure, and calculated final flow quantity.
10. For venturi type, pitot tube, or other flow measuring devices, record the pipe size, manufacturer and size of device, and the direct reading of the differential pressure, and calculated final flow.
11. Upon completion of the water balance, reconcile the total heat transfer through all coils by recording the entering and leaving water temperatures and the entering and leaving air dry bulb and wet bulb temperatures. Adjust differential bypasses for the same pressure drop on full bypass as on full flow.
12. Do not perform adjustments until the entire system has been pressure tested, flushed and cleaned.
13. In conjunction with pump manufacturer for multiple pump, pumping systems, construct and submit system curves indicating operating point with one pump operating, two pumps operating, three pumps operating, etc.
14. Record all system pressure and temperature readings.

**C. Air Balancing**

1. Adjust all air systems by AABC or NEBB certified balancing subcontractor acceptable to the City of New York and Commissioner.



2. Operate fan systems for as long a time as will be necessary to test air flow from openings, make necessary damper and other adjustments until even distribution is obtained, throughout the various systems, with the air quantities required at each outlet or inlet as shown on the Drawings. Make noise level measurements for the operation of mechanical equipment selected by the Commissioner in order to determine if the equipment produces excessive noise in occupied areas of the building.
3. Before any air balance work is done, test the system for duct leakage, install clean filters, check for correct fan rotation and equipment vibration, check automatic dampers for proper operation, and verify that all fire dampers are open.
4. Fans to be adjusted to deliver above system requirements to compensate for duct leakage.
5. Preliminary adjustment may be made prior to completion of systems; however, final balancing must be done with all systems completely installed and operating, including all air outlets and return grilles.
6. Record the pressure drop across the filters in air systems prior to balancing. Systems to be adjusted with clean filters.
7. Traverse main supply air ducts, using a pitot tube and manometer. Calibrate the manometer to read two (2) significant figures in all velocity pressure ranges. A main duct is defined as any of the following:
  - a. A duct serving five (5) or more outlets.
  - b. A duct serving two (2) or more branch ducts.
  - c. A duct serving a heating coil.
  - d. A zone duct from a VAV unit.
  - e. A duct emanating from a fan discharge or plenum and terminating at one or more outlets.
  - f. All supply and exhaust risers.
8. The intent of this operation is to measure by traverse the total air quantity supplied by the fan and to verify the distribution of air to zones.
9. Submit data in support of all supply fan deliveries by the following four (4) methods:
  - a. By summation of the air quantity readings at outlets.
  - b. By duct traverses of main supply ducts.
  - c. By rotating vane traverse across a filter or coil bank.
  - d. By plotting revolutions per minute and static pressure readings on the fan curve. Air density corrections must be indicated.
10. For return air and exhaust fans, the second and third methods listed above (b. & c.) can be omitted.



11. Inspect fan scrolls and remove objects or debris. Inspect coils and remove debris or obstructions. Verify that all fire dampers are open and control dampers are in their proper position.
12. Record the following design requirements for fans and fan motors from the design drawings and reviewed shop drawings:
  - a. Manufacturer, model and size.
  - b. Air quantities - cubic feet per minute.
  - c. Approximate fan speed - revolutions per minute.
  - d. Fan static pressure (total or external) - inches of water.
  - e. Outlet velocity - feet per minute.
  - f. Fan brake horsepower.
  - g. Motor horsepower.
  - h. Volts, hertz, amperes and service factor at design conditions.
13. Record the following data from fans and fan motors installed at the project:
  - a. Manufacturer, model and size.
  - b. Motor horsepower, service factor and revolutions per minute.
  - c. Volts, hertz, full load amperes and service factor.
  - d. Motor starter and heater size.
  - e. Equipment location.
14. Completely adjust fans and duct systems by the adjustment of sheaves, dampers, and other volume and diverting control devices, to obtain the air quantities indicated in the Contract Documents. Integral dampers in terminal outlets and inlets are not to be used for adjustment of duct branches. Adjust outside air and return air modulating dampers to admit the specified quantities of air under all cycles of operation. Adjust final air quantities within 10% of the design requirements. Balance air outlets with air pattern as shown on the Drawings.
15. Record the following test data for fans and fan motors installed at the project at final balanced conditions:
  - a. Fan speed - revolutions per minute.
  - b. Fan suction, discharge and total static pressure (external or total) - inches of water.



- c. Static pressure drops across filters, dampers, coils, washers and eliminators in the supply fan casings in inches of water.
  - d. Motor operating amperes and voltage per phase at operating conditions.
  - e. Fan cubic feet per minute as required above.
  - f. Calculated brake horsepower.
16. Prepare single line diagrams of duct systems indicating terminal outlets identified by number. List on data sheets all such outlets denoted by the same numbers, including the outlet size, "K" factor, location, cubic feet per minute and jet velocity. Submit this data for supply, return and exhaust air systems.
  17. Adjust the minimum and maximum settings on all devices.
  18. Adjust the outside air and return dampers to admit the required amounts of air under both summer and winter cycles. Record the outside, return and mixed air temperatures for both cycles after final adjustments.
  19. Adjust the minimum, maximum, return and exhaust/spill air dampers so that the respective fans deliver the correct cubic feet per minute at all damper positions. Should the observed air quantities be less than 95% or more than 105% of the specified amount, change driving pulley ratio to make acceptable changes to obtain the specified or scheduled air quantities.
  20. Balance and adjust supply air systems as follows:
    - a. Systems installed with trunk ducts only, with no air outlets, to be balanced by adding a volume damper at each end of the trunk duct (minimum of two (2) dampers per system if duct is looped). Make adjustments to the air handling units as required to deliver the volume of air within 10% of design flow at the static pressure and cold air supply temperature shown on the Drawings. Remove dampers and seal or re-cap openings after reports have been accepted by The Commissioner.
    - b. Systems installed with main duct capped at wall of fan room will be balanced by installing an opposed blade damper at each capped connection. Make adjustments as required to deliver the volume of air within 10% of design flow at the static pressure and cold air supply temperature shown on the Drawings. Remove dampers and re-cap openings after reports have been accepted by the commissioner.
    - c. Systems installed partially complete will be balanced by installing a volume damper in duct allocated for remaining portion of system. Make adjustments as required to deliver the volume of air within 10% of design flow at the static pressure and cold air supply temperature shown on the Drawings. Remove damper and re-cap or seal openings after reports have been accepted by the commissioner.



- d. Balance and adjust supply air systems installed in finished areas of the building (except for areas with inaccessible ceiling construction) as follows:
    - 1) After duct systems have been installed complete with all grilles, dampers, ducts, coils, automatic temperature controls, and other items hereinafter specified, make the adjustments to the air handling units and all outlets as required to deliver the volume of air within 10% of design flow as shown on the Drawings with design cold duct temperatures. After the finished area is occupied, readjust the air volumes if required, to properly balance the cooling and heating loads throughout the conditioned areas.
  - e. Balance and adjust completed supply air systems installed in areas with inaccessible ceilings as follows:
    - 1) After duct systems have been installed complete with all dampers, ducts, coils, and other items hereinafter specified, except for final connection to grille or air outlet, and prior to inaccessible ceiling installation, make adjustments, as required, to deliver the volume of air at each interior and perimeter air tap proportionally within 10% of design flow as shown on the Drawings.
    - 2) After each duct system has been adjusted, securely lock each manual damper, splitter, spin-in damper, etc., with sheetmetal screws prior to installation of ceiling.
    - 3) Submit balancing reports to the Commissioner for review and comment as specified hereinafter, prior to the installation of the inaccessible ceiling. Do not conceal duct system prior to the receipt of an air balance report which has been accepted by the commissioner for the system.
    - 4) After ceiling installation, install each air outlet with air patterns as shown on the Drawings. Make final air balance adjustment by increasing or decreasing the air handling fan powered terminal unit fan rpm.
21. The air balancing subcontractor shall visit the project site as often as necessary prior to the start of balancing procedures to verify that the duct systems have been properly installed complete with all grilles, dampers, ducts, coils, etc., and that the return air paths through walls, grilles, lighting fixtures, and slot diffusers are completely open and unobstructed. The air balancing subcontractor shall also verify that adequate access to equipment and balancing devices has been provided and that the temporary plastic coverings on the lighting fixtures used for supplying conditioned air have been removed. The air balancing subcontractor shall submit a written report to the Commissioner and City of New York within one (1) week after each visit.
22. For balancing air outlets, use a flow hood for the air balance. The instrument to be complete with a flow hood kit complete with flow hood tops specifically designed to accurately measure the air outlets specified for this project. The flow hood's accuracy and the instrument calibration for measuring the air flow from the air distribution device specified for the project must be verified in an independent testing laboratory acceptable to the City of New York and Commissioner.



23. For garage supply and exhaust, all smoke exhaust and make-up, toilet exhaust, and other exhaust air systems have been installed complete with all ductwork, grilles, dampers, fans, and other items as hereinafter specified, make adjustments, as required to deliver the volumes of air at each inlet or outlet within 10% of design flow.
24. After all miscellaneous ventilation systems have been installed complete with all duct, grilles, louvers, dampers, fans, and other items as hereinafter specified, make adjustments, as required to deliver to volumes of air, or differential static pressures in the case of the pressurization fans, at each air inlet and/or outlet within 10% of design flow.

### **3.3 DUCT TESTING OF LIFE SAFETY VENTILATION SYSTEMS**

#### **A. General**

1. Perform all tests as specified herein. The mechanical, fire protection, fire alarm, electrical, controls subcontractors and the Contractor shall be present and participate during the entire testing procedures.
2. The Contractor shall include all costs associated with the required demonstration tests, including smoke bombs, instrumentation, etc.

#### **B. Smoke Control System**

1. Verify and record that the quantity of air indicated on the Drawings is exhausted at the smoke removal inlet and verify and record the quantity of air flowing through the exhaust fan. Tests shall demonstrate the proper sequence of the fire safety ventilation systems, the activation of the smoke detection system, smoke exhaust system, operation of smoke dampers and fire/smoke dampers, and makeup air from the outside air and stairwell systems.
2. Performance test the smoke management systems installed in this project in accordance with the requirements of the Fire Department.
3. Conduct the demonstration tests and repeat until they are accepted and approved.

### **3.4 FINAL REPORT**

- A. If the work is completed during the heating season, perform the final tests of cooling equipment the following summer; if completed during the summer, perform test on heating system the following winter.
- B. After each seasonal adjustment is made, prepare a detailed report and submit to the Commissioner for approval.
- C. Demonstrate to the Commissioner and City of New York, prior to substantial completion, that all systems and/or equipment have been balanced and adjusted properly, and that the system and/or equipment is in compliance with the Contract Documents.

**END OF SECTION 23 05 93**



**Department of  
Design and  
Construction**

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**SECTION 23 07 00  
INSULATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide thermal insulation in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Piping Insulation.
- B. Duct Insulation.
- C. Equipment Insulation.
- D. Fire-rated duct wrap

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit list of insulation to be used for each service.
- C. Product Data: Manufacturer's latest published data for materials, "R" values and installation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Comply with all requirements of ASTM for thermal and moisture transmission.



- C. Provide insulation (including insulation jacket or facing and adhesives used to adhere the facing or jacket to the insulation) with non-combustible material meeting New York City Building, Energy and Mechanical Code requirements and fire and smoke hazard ratings as tested by procedure ASTM E-84, National Fire Protection Association 255, and UL 723, not exceeding flame spread 25 and smoke developed 50. Adhesives, mastics, cements, etc. shall not exceed the same component ratings. Foam glass insulation to be manufactured in accordance with ASTM C552.
- D. All insulating products and coverings to be U.L. listed.
- E. Insulation materials, including all weather and vapor barrier materials, jackets, fitting covers, and other accessories, shall be furnished and installed in strict accordance with project drawings, specifications and manufacturer's requirements.
- F. Insulation materials and accessories shall be installed in a workmanlike manner by skilled and experienced workers who are regularly engaged in commercial insulation work.

**1.5 DELIVERY AND STORAGE OF MATERIALS**

- A. All of the insulation materials and accessories covered by this specification shall be delivered to the job site and stored in a safe, dry place with appropriate labels and/or other product identification.
- B. The contractor shall use whatever means are necessary to protect the insulation materials and accessories before, during, and after installation. No insulation material shall be installed that has become damaged in any way. The contractor shall also use all means necessary to protect work and materials installed by other trades.
- C. Any installed or stored insulation material that has become wet, soiled or damaged because of transit or job site exposure to moisture or water shall be immediately removed from the job site.

**PART 2 - PRODUCTS**

**2.1 PIPE INSULATION**

**A. Materials**

1. When the temperature of a fluid falls within the following temperature ranges at any time during the system cycle, provide the insulation thickness indicated.

Insulation Thickness For Indicated Pipe Size							
Service	Temp. Range °F	Material	Pipe Size				
			<1"	1" to <1.5"	1.5" to <4"	4" to <8"	≥8"
Steam (125 psig and higher)	351 to 450	Glass Fiber	4.5"	5"	5"	5"	5"



Insulation Thickness For Indicated Pipe Size							
Service	Temp. Range °F	Material	Pipe Size				
			<1"	1" to <1.5"	1.5" to <4"	4" to <8"	≥8"
Steam (16 psig to 124 psig)	251 to 350	Glass Fiber	3"	4"	4.5"	4.5"	4.5"
Steam (15 psig and lower), steam condensate and boiler feed water.	201 to 250	Glass Fiber	2.5"	2.5"	2.5"	3"	3"
Hot water and glycol	201 to 250	Glass Fiber	2.5"	2.5"	2.5"	3"	3"
Hot Water and glycol	141 to 200	Glass Fiber	1.5"	1.5"	2"	2"	2"
Hot Water and glycol	105 to 140	Glass Fiber	1"	1"	1.5"	1.5"	1.5"
Water, glycol, brine, condenser water (Waterside Economizer)	40 to 60	Glass Fiber or Closed Cell	0.5"	0.5"	1"	1"	1"
Chilled water, glycol, brine, Refrigerant	Below 40	Glass Fiber or Closed Cell	0.5"	1"	1"	1"	1.5"
Condensate drains above hung ceilings and in shafts	-	Glass Fiber or Closed Cell	0.5"	0.5"	0.5"	1"	1"
Domestic Fresh Water	-	Glass Fiber or Closed Cell	1"	1"	1"	1"	1"
Refrigerant hot gas (exposed)	Above 100	Glass fiber	0.5"2	0.5"	0.5"	--	--

- B. Provide insulation materials and thickness for steam piping and metering equipment at the building service entry in accordance with Utility Company requirements.
- C. Fiberglass Insulation: Fiberglass pipe insulation in equipment rooms and/or where exposed to be of the sectional type having 6 lbs./cu. ft. density. Thermal conductivity of fiberglass to be .23 BTU-in/hr.sq.ft °F at a mean temperature of 75°F.



- D. Closed cell Foam Insulation: Closed cell foam pipe insulation density to be 8 lbs/cu. ft. Thermal conductivity of closed cell insulation to be .245 BTU-in/hr.sq.ft °F at a mean temperature of 75°F.
- E. Calcium Silicate Insulation: Thermal conductivity of calcium silicate to be .32 BTU-in/hr.sq.ft °F at a mean temperature of 100°F
- F. Insulation Jackets
1. Concealed pipes carrying fluids 105°F and above. Factory applied white fire retardant all service jacket, (ASJ), stapled and banded. Pipes shall be banded with not less than 3 bands per section.
  2. Exposed pipes carrying fluids 105°F and above. Factory applied white fire retardant all service jacket, (ASJ), with butt strips stapled and banded. Pipes shall be banded with not less than 3 bands per section.
  3. Pipes carrying fluids 60°F and below up to 14 inches. Factory applied white fire-retardant vapor barrier all service jacket with self-sealing lap (ASJ) and butt strip. Ends of pipe insulation shall be sealed off at valves, fittings and flanges with vapor barrier mastic.
  4. Pipes carrying fluids 60°F and below over 14 inches. Factory applied white fire-retardant vapor barrier all service jacket (ASJ) sealed with self-sealing lap. All circumferential joints shall be wrapped with a 3-inch-wide strip of white fire-retardant jacket adhered with self-sealing lap. Ends of pipe insulation shall be sealed off at valves, fittings and flanges with vapor mastic.
  5. Finish calcium silicate with glass lagging cloth adhered with Childers CP-50AMV1, Vimasco 714, Foster 30-36 lagging adhesive or approved equal.
  6. Vapor barrier jacket permeability shall be 0.02 perms.
  7. When multiple layers are required, all inner layer(s) shall be provided without all service jacket.
- G. Fittings, Valves and Flanges
1. Factory pre-molded insulation fittings shall be of the same material and thickness as the pipe insulation for fittings, flanges and valves.
  2. Where factory pre-molded insulation fittings are not used, insulate fittings, flanges and valves with mitered segments of the same thickness and density as the adjoining pipe covering.
  3. On cold systems, particular care must be given to vapor sealing the fitting cover or finish to the pipe insulation vapor barrier. All valve stems shall be sealed with caulking to allow free movement of the stem but provide a seal against moisture incursion.



- H. Piping located outdoors and exposed to the weather shall be protected with the following weatherproof finishes:
1. Metal jacketing shall be 0.016" minimum aluminum or stainless steel with moisture barrier, secured in accordance with the jacket manufacturer's recommendations. Joints shall be applied so they will shed water and shall be sealed completely with Foster 95-44, Vimasco, Childers CP-76 or approved equal metal jacketing sealant.
  2. UV resistant PVC jacketing may be applied in lieu of metal jacketing provided jacketing manufacturer's limitations with regard to pipe size, surface temperature, and thermal expansion and contraction are followed.
  3. Fittings shall be insulated as prescribed above, jacketed with preformed fitting covers matching outer jacketing used on straight pipe sections, with all joints weather sealed.
  4. On outdoor chilled water and refrigerant lines, the insulation system shall be completely vapor sealed with vapor barrier mastic before the weather-resistant jacket is applied. The outdoor jacket shall not compromise the vapor barrier by penetration of fasteners, etc. Vapor stops at butt joints shall be applied at every fourth pipe section joint and at each fitting to prevent of water incursion.

**2.2 DUCTWORK INSULATION**

A. Glass Fiber Blanket

1. Glass fiber blanket insulation shall be insulated with 0.75 pcf density, FSK-faced fibrous glass duct wrap insulation having a k-value of .28 BTU-in/hr.sq.ft °F.
2. The duct wrap insulation shall consist of a blanket-type insulation composed of wool-type glass fibers firmly bonded with a thermosetting resin. Duct wrap material shall be factory-laminated to a scrim reinforced, foil-kraft (FSK) vapor retarder facing have a 2" stapling flange on one edge.
3. When installed in accordance with recommended installation procedures, duct wrap insulation shall provide installed R-values as follows:

Density	Labeled Thickness	Installed R-Value
.75PCF	1.5"	4.2
.75PCF	2"	5.6
.75PCF	2.125"	6.0
.75PCF	2.25"	6.5
.75PCF	2.5"	7.0
.75PCF	3"	8.5
1.0PCF	1.5"	4.5
1.0PCF	2"	6.1
1.5PCF	1.5"	4.8
1.5PCF	2"	6.4



**B. Fiberglass Duct Board**

1. Material to be high-density fiberglass duct board with foil kraft laminate facing, reinforced with scrim. Maximum thermal conductivity (K-value) at 75°F mean temperature to be 0.23 BTU-in/hr.sq.ft °F when tested in accordance with ASTM C518 or ASTM C177.

**C. Application**

Service	Material	Insulation Thickness
Heated or Cooled Supply Air Ducts, concealed in unconditioned spaces, including shafts and hung ceilings	Glass Fiber Blanket	2"
Heated or Cooled Supply Air Ducts, in hung ceilings used as Return Air Plenums	Glass Fiber Blanket	0.75"
Heated and Cooled Supply Air Ducts exposed in unheated space	Glass Fiber Board	1.5"
Cooled Supply Air Ducts exposed in unconditioned space	Glass Fiber Board	1.5"
Return & Relief Air Ducts from heated or cooled spaces in unconditioned spaces including shafts and hung ceilings.	Glass Fiber Blanket	1"
Return and relief air ducts from heated or cooled spaces in exposed locations.	Glass Fiber Rigid Board	1"
Exposed Outside Air Intake Ducts & Plenums from intake louver to supply system.	Glass Fiber Rigid Board	1.5"
Raw Outside air ducts in shafts.	Glass Fiber Blanket	1.5"
Raw Outside air ducts in hung ceilings	Glass Fiber Blanket	2 layers – 1.5" each
Unused portion of louvers where blanked off with sheet metal	Glass Fiber Rigid Board	1.5"
Exhaust or Relief Air Ducts from automatic louvered damper to discharge at exterior openings	Glass Fiber Rigid Board	1"



Service	Material	Insulation Thickness
Boiler Stacks and Breechings	Calcium Silicate Block	4"

- D. Rigid Glass Fiber Board to be six (6) pound per cu. ft. density with factory applied white fire-retardant jacket (ASJ). Apply with mechanical fasteners. Seal all seams, joints, tears, penetrations and breaks with vapor barrier mastic to prevent moisture ingress.
- E. Boiler Stacks and Breechings: Calcium silicate wired over 1 inch high rib lath.

**2.3 EQUIPMENT INSULATION**

**A. Materials**

Service	Material	Insulation Thickness
Flash tanks, condensate tanks, hot water expansion tanks	Glass Fiber Board, or Calcium Silicate	1"
Chilled water expansion tanks	Glass Fiber Board	1"
Boilers	Glass Fiber Board	1.5"
Chiller Evaporator	Glass Fiber Board	2"
Hot, chilled and condenser (free cooling only) water pumps, feed water pumps	Glass Fiber Board	2"
Steam PRV control valves	Custom Fit Cover	2"
Shell and tube heat exchangers	Glass Fiber Board	1.5"
Exposed supply fans cooling systems only	Glass Fiber Board	1"
Chiller Evaporators heads and water boxes, Chilled water plate heat exchanger	Glass Fiber Board	2"

- B. Hot Equipment: Glass fiber board, 6 pounds per cu. ft. density or calcium silicate block. Finish with ½-inch-thick cement over copper clad hexagonal wire.
- C. Cold Equipment: Glass fiber vapor seal type board, 6 pounds per cu. ft. density faced with FRK jacket. Finish with ½-inch-thick cement over vapor barrier mastic and reinforcing mesh.



**2.4 FIRE-RATED DUCT WRAP**

**A. Fire Wraps**

1. Fire wrap shall be approved for intended use by New York City Building, Energy and Mechanical Code.
2. Fire rated duct wrap shall be a flexible fire-resistant wrap consisting of an inorganic fiber blanket encapsulated with a scrim-reinforced foil.
3. The product shall be 1-1/12 in. thick, 6 pcf density.
4. Fire wrap shall be used to fire rate ventilation ducts.
5. Fire wrap installation shall be in strict accordance with manufacture’s written instructions, as shown on the approved shop drawings. The fiber blanket shall have a continuous use limit of 1000°C (1832°F). The blanket thermal resistance (R-value) at ambient temperature shall be minimum 6.3 °F – ft2 – hr (Btu).
6. Smoke Developed Index and Flame Spread Index of the bare blanket, and of the foil encapsulated blanket shall be 0/0. The foil encapsulation shall be bonded to the core blanket material.
7. Design Listing

<b>Fire Resistive Rating</b>	<b>Enclosure System</b>
Grease Duct 1 and 2 hour	ASTM E 2336 / ICC-ES AC101 2 layers of Fire Wrap
Other rated ducts 1 and 2 hour	ISO 6944 1 layer of Fire Wrap

**2.5 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.**
1. Calcium Silicate Adhesive: Fibrous, sodium-silicate-based adhesive with a service temperature range of 50 to 1000 deg F.
    - a. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - b. Adhesive shall comply with the testing and product requirements of New York City Building, Energy and Mechanical Code.



- B. Mineral-Fiber Adhesive: Comply with ASTM C 916, Type II
  - 1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Adhesive shall comply with the testing and product requirements of New York City Building, Energy and Mechanical Code.
- C. ASJ Adhesive: Comply with ASTM C 916, Type II for bonding insulation jacket lap seams and joints.
  - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Adhesive shall comply with the testing and product requirements of New York City Building, Energy and Mechanical Code.
- D. PVC Jacket Adhesive: Compatible with PVC jacket.
  - 1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Adhesive shall comply with the testing and product requirements of New York City Building, Energy and Mechanical Code.

## 2.6 SEALANTS

- A. FSK and Metal Jacket Flashing Sealants:
  - 1. Materials shall be compatible with insulation materials, jackets, and substrates.
  - 2. Fire- and water-resistant, flexible, elastomeric sealant.
  - 3. Service Temperature Range: Minus 40 to plus 250 deg F.
  - 4. Color: Aluminum.
  - 5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 6. Sealants shall comply with LEED IEQ 4.1 for VOC Content
- B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
  - 1. Materials shall be compatible with insulation materials, jackets, and substrates.
  - 2. Fire- and water-resistant, flexible, elastomeric sealant.
  - 3. Service Temperature Range: Minus 40 to plus 250 deg F.



4. Color: White.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
6. Sealants shall comply with the testing and product requirements of New York City Building, Energy and Mechanical Code.

#### C. FACTORY-APPLIED JACKETS

1. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
  - a. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
  - b. PVDC Jacket for Outdoor Applications: 6-mil- (0.15-mm-) thick, white PVDC biaxially oriented barrier film with a permeance at 0.01 perm when tested according to ASTM E 96/E 96M and with a flame-spread index of 5 and a smoke-developed index of 25 when tested according to ASTM E 84.

### 2.7 MANUFACTURERS

#### A. Insulation

1. Glass Fiber
  - a. Owens-Corning Fiberglass
  - b. Johns-Manville
  - c. Armstrong
  - d. Certain-Teed
  - e. Knauf
  - f. Or approved equal
2. Closed Cell Foam Insulation
  - a. Aeroflex
  - b. Armacell
  - c. Kflex
  - d. Or approved equal



- B. Adhesives and Sealers
  - 1. Foster (H.B. Fuller Co.)
  - 2. Rubatex
  - 3. Childers
  - 4. Or approved equal
- C. Fire Wrap
  - 1. 3M
  - 2. FireMaster
  - 3. Unifrax
  - 4. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION OF INSULATION - GENERAL**

- A. Perform work in strict accordance with the manufacturer's recommendation and the best practice of the trade and the intent of this specification.
- B. Ensure that insulation is clean, dry, and in good mechanical condition with all factory-applied vapor or weather barriers intact and undamaged. Any wet, dirty, or damaged insulation stored or already installed shall be immediately removed from the construction site and are not acceptable for installation.
- C. Apply insulation over clean dry surface, butting sections or surfaces firmly together and finishing as specified.
- D. Seal vapor barriers in a continuous manner throughout to prevent moisture penetration.
- E. Insulation to be continuous through wall, floor and ceiling openings, pipe supports or sleeves. Do not cover any nameplates or identification tags.

#### **3.2 INSULATION OF DUCT WORK AND FITTINGS**

- A. No insulation shall be installed until ductwork has been pressure tested or leak tested as specified elsewhere to the satisfaction of the Commissioner.
- B. Before applying duct wrap, steel metal ducts shall be clean, dry, and tightly sealed at all joints and seams.
- C. All portions of duct designated to receive duct wrap shall be completely covered with duct wrap.



- D. To ensure installed thermal performance, duct wrap shall be cut to “stretch-out” dimensions as follows (P = perimeter of duct in inches/mm):

Labeled Thickness	Average Installed Thickness.	Thickness Calculation To Arrive at Correct Installed Thickness		
		Round Duct	Square Duct	Rectangular Duct
1.5”	1.125”	P+ 9.5”	P+ 8.0”	P+ 7.0”
2”	1.5”	P+ 12.0”	P+ 10.0”	P+ 8.0”
2.25”	1.69”	P+ 13.5”	P+ 11.5”	P+ 9.0”
2.5”	1.88”	P+ 14.5”	P+ 12.5”	P+ 9.5”
3”	2.25”	P+ 17.0”	P+ 14.5”	P+ 11.5”

- E. A 2” piece of insulation shall be removed from the facing at the end of the piece of insulation to form an overlapping stapling and taping flap
- F. Install duct wrap insulation with facing outside so that the stapling flap overlaps the insulation and facing at the other end of the piece of duct wrap. Adjacent sections of duct wrap insulation shall be tightly butted, with the 2” stapling and taping flap overlapping. If ducts are rectangular or square, install so insulation is not excessively compressed at corners. Seams shall be stapled approximately 6” (152 mm) on center, with ½” minimum, steel, outward-clinching, staples.
- G. Where a vapor barrier is required, seams shall be sealed with pressure-sensitive tape matching the insulation facing, either plain foil or fil-scrim-kraft (FSK). Seal all tears, punctures, and other penetrations of the duct wrap facing with tape or mastic to provide a vapor-tight system.
- H. Wherever external duct insulation is specified and internal acoustic treatment of equivalent insulating effect is also required (by Drawings or Specifications) for the same location, the external insulation may be omitted.
- I. Cover ductwork exposed to outdoor conditions, including spaces ventilated with outdoor air, with an additional 2-inch thick 5 lbs./cu.ft density., aluminum foil coated with PVC backing insulation.
- J. Apply vapor seal type board by mechanical fasteners such as Graham pins and speed washers. Seal joints with an adhesive, as approved and reinforced with a glass cloth membrane over vapor barrier mastic and self-sealing matching tape. Butter pinheads with an adhesive, as approved. If vapor seal type board is wired, use tin edges to protect the corners of the board. Seal edges and joints.

**3.3 INSULATION FOR HVAC EQUIPMENT**

- A. Enclose removable heads for equipment, (such as coolers, heat exchangers and horizontally split pumps) in aluminum sheet metal boxes for easy removal with fiberglass board applied to inside of sheet metal boxes of thickness as described above. Provide lifting handles for removal of boxes.



- B. Install equipment insulation furnished loose by the equipment manufacturer in accordance with manufacturer's instructions.

### **3.4 INSTALLATION OF CALCIUM SILICATE INSULATION**

- A. Secure single-layer insulation with stainless-steel bands at 12-inch intervals and tighten bands without deforming insulation material.
- B. Install two-layer insulation with joints tightly butted and staggered at least 3 inches. Secure the inner layer with wire spaced at 12-inch intervals. Secure the outer layer with stainless-steel bands at 12-inch intervals.
- C. On exposed applications without metal jacket, finish insulation surface with a skim coat of mineral-fiber, hydraulic-setting cement. When cement is dry, apply flood coat of lagging adhesive and press on one layer of glass cloth. Overlap edges at least 1 inch. Apply finish coat of lagging adhesive over glass cloth. Thin finish coat shall be applied to achieve a smooth, uniform finish.

### **3.5 PIPING INSULATION**

- A. Insulation must not be installed at fittings and joints until the piping systems have been hydrostatically tested as specified elsewhere to the satisfaction of the Commissioner.
- B. Provide insulation for removable flanges of pipe strainers on cold services with built-up sections of glass fiber pipe covering, arranged to facilitate servicing of the strainer. Complete applications with vapor seals. Vapor barriers to be sealed and continuous through hangers, walls, sleeves, etc. Adhesives and coatings to be as noted herein.
- C. Piping Exposed to Outdoor Conditions
  - 1. Pipes in Spaces that are not heated and Pipes Subject to Freezing: Cover piping with an additional layer of 2 inches glass fiber insulation of the same finish as specified for the particular service in paragraph 2.1, but not less than 3 inches total thickness.
- D. Insulate heat-traced piping as specified for piping exposed to outdoors. Cover with an aluminum jacket, as specified for piping exposed to the outdoors.
- E. Notify Mechanical subcontractor of any leaks in pipe or joints. Do not insulate until leaks have been repaired. Replace all insulation dampened by leaks.
- F. Apply prefabricated sectional insulation for straight pipes neatly fitted around the piping, and sealed with adhesive. Apply adhesive to only one side of each joint and not to pipe surface.
- G. Seal all joints with fire resistant vapor barrier mastic. Where required, oversized pipe sections or board type insulation may be used to fabricate and install insulation around pipe specialties. All void space must be firmly filled with flexible insulation to support oversized pipe insulation.
- H. Maintain the integrity of factory-applied vapor barrier jacketing on all pipe insulation, protecting it against puncture, tears or other damage. All staples used on cold pipe insulation shall be coated with suitable sealant to maintain vapor barrier integrity.



- I. Secure sectional insulation with 0.02" thick by ½" wide aluminum bands manufactured by Childers, Vimasco or Thomas & Betts "TY-RAP" or approved equal nylon ties, on 24" centers for pipe sizes 2" and larger. Install at least two (2) bands per section of insulation.
- J. Insulate cold water ball valves with ¾" thick flexible elastomeric sheet insulation (ASTM C534) or approved equal as detailed on the Drawings. Finish insulation with two (2) coats of Rubatex 374, Vimasco 728, Foster 30-64 coating or approved equal.
- K. Insulation of cold water vertical risers shall not be interrupted by support clamps.
- L. Insulate and thoroughly vapor seal control valve bodies where the valve actuator penetrates the insulation.
- M. Replace any self-sealing insulation and/or lap that is found to be not sealing properly. Do not use staples to secure the insulation, lap, or coverings.
- N. Thermal Insulation for Engine Exhaust Piping
  - 1. Insulate entire engine exhaust pipe, from the engine expansion connection to outside the building including the muffler, with three (3) layers of 1½" thick hydrous calcium silicate non-asbestos insulation (ASTM C533), installed over spacers to allow a 1" air space between pipe and insulation.
  - 2. Stagger joints for the first, second and third layers.
  - 3. Apply aluminum jacket (ASTM B209) over outer layer of insulation as specified for piping exposed to weather.
  - 4. Insulate exhaust muffler in the same manner as the exhaust piping.
  - 5. Wrap or pack all protrusions through the insulation with refractory fiber. Seal all joints and cracks.
  - 6. Provide expansion joints in the insulation and aluminum jacket as recommended by the manufacturer to allow for differential expansion between the exhaust pipe, insulation and jacket.

### **3.6 FINISHING OF INSULATION**

- A. Finish hot service pipe fittings and valve applications with open weave glass mesh adhered with Vimasco WC 7, Childers CP-10/11, Foster 46-50 or approved equal weather barrier breather mastic. Vapor seal type for cold applications with tack coat of Vimasco 749, Childers Chil Out CP-33 or Foster Vapor Out 30-33 or approved equal vapor barrier mastic with open weave glass mesh (Childers Chil Glas #10, Vimasco or Foster Mast a Fab or approved equal) laid in while wet with final coat with same vapor barrier mastic. Overlap glass mesh and outer coat adjacent covering by at least 2 inches. Do not insulate flanges until systems are operational.
- B. Exposed insulation on all general HVAC ducts, boiler stacks and breeching shall be finished with two (2) coats of cement over hexagonal copper clad steel wire. Finish shall be at least 1/2 inch thick.



### **3.7 PROTECTION OF INSULATION**

- A. Protect pipe covering at hangers, guides, and roller supports with 16 gauge galvanized metal shields or saddles (at least 3 times the insulation diameter in length and 1/3 the insulation circumference in width) on the outside of the insulation and vapor barrier. Hold shields in place with straps. Do not pierce the insulation with hangers. Where glass fiber insulation is used on piping 3 inches and larger, provide half-section of calcium silicate covering of equal thickness at metal shields.
- B. Piping Exposed to Outdoors: Cover insulated piping exposed to outdoors or called for to be weatherproofed, in addition to finishes specified, with an aluminum or stainless steel jacket similar from ITW Insulation, RPR Products, Owens Corning or approved equal, including all fittings.
- C. Exposed insulated piping in parking garages shall be provided with an aluminum insulation jacket from ITW Insulation, RPR Products, Owens Corning or approved equal.
- D. Exposed insulated piping in mechanical equipment rooms located 8 feet or less above the floor or where subject to traffic shall be provided with an aluminum insulation jacket from ITW Insulation, Owens Corning, RPR Products or approved equal.

### **3.8 INSPECTION**

- A. Upon completion of installation of duct wrap and before system operation is to commence, visually inspect the system and verify that duct insulation has been correctly installed.
- B. Open all system dampers and turn on fans to purge all scraps and other loose pieces of material from the duct system. Allow for a means of removal of such material from the duct system.
- C. Check the duct system to ensure that there are no air leaks through duct joints.
- D. Fill surface imperfections such as chipped edges, small joints or cracks and voids or holes with insulation material and smooth all such areas with a skim coat of insulating cement.

### **3.9 SAFETY PRECAUTIONS**

- A. Insulation subcontractor's employees shall be properly protected during installation of all insulation. Protection shall include proper attire when handling and applying insulation materials, and shall include (but not be limited to) disposable dust respirators, gloves, hard hats, and eye protection.
- B. The insulation subcontractor shall conduct all job site operations in compliance with applicable provisions of the Occupational Safety and Health Act (OSHA), as well as with all New York State and City safety and health codes and regulations that may apply to the work.

**END OF SECTION 23 07 00**



**Department of  
Design and  
Construction**

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**SECTION 23 08 00  
COMMISSIONING OF HVAC**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract]

**1.2 SUMMARY**

- A. This section includes commissioning process requirements for HVAC&R systems, assemblies, and equipment.

- B. Related Sections:

DDC General Conditions Section for general commissioning process requirements.

**1.3 DESCRIPTION**

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the installing contractors to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

**1.4 DEFINITIONS**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for definitions.

**1.5 SUBMITTALS**

- A. Refer to DDC General Conditions Section "Submittal Procedures" for all submittals.
- B. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment



specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

- C. The CxA will receive a copy of the final approved submittals.
- D. In addition, the contractor is to provide the following:
  - 1. Certificate of readiness
  - 2. Certificates of completion of installation, prestart, and startup activities.
  - 3. O&M manuals
  - 4. Test reports
- E. Refer to DDC General Conditions for general commissioning submittal requirements.

#### **1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section "Quality Requirements".
- B. 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. Commissioning Kick-Off Meeting – Construction Team: Contractors will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.
- B. Commissioning Meetings: Contractors will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.
- C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA shall be provided with the subsequent meeting minutes for review.
- D. Pre-testing Meetings: Contractors will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.



- E. Testing: Contractors will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: Contractors will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: Contractors will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT**

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the HVAC&R system and controls system in Division 23, 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. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## **PART 3 - EXECUTION**

### **3.1 GENERAL DOCUMENTATION REQUIREMENTS**

- A. With assistance from the Contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractors for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits.
- B. Red-lined Drawings (As-Builts): Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created



from the red-lined drawings. The 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 Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

### **3.2 CONTRACTOR'S RESPONSIBILITIES**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for general contractor's responsibilities.
- B. Attend construction phase controls coordination meetings.
- C. Attend testing, adjusting, and balancing review and coordination meetings.
- D. Provide information requested by the CxA for final commissioning documentation.
- E. Prepare preliminary schedule for mechanical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for The City of New York. Distribute preliminary schedule to commissioning team members at the beginning of the construction phase.
- F. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.
- G. Provide detailed startup procedures.
- H. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications
- I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- J. Respond to provided new deficiencies and/or responses within five (5) business days.
- K. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the specifications. Submit to CxA 45 days after submittal acceptance.
- L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.



- M. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.
- N. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.
  - 1. Chiller
  - 2. Chilled Water Pumps
  - 3. Energy Recovery Units
  - 4. HV Units
  - 5. Make Up Air Units
  - 6. Exhaust Fans
  - 7. Rooftop Units
  - 8. Condensing Boilers
  - 9. Hot Water Pumps
  - 10. Unit Heaters
  - 11. Packaged AC Units
  - 12. Split System - AC Units
  - 13. Building Management System
- 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 Commissioner for review and acceptance.
  - 3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.



4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R contractor and the Contractor.
5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
6. Provided recommended setpoints as determined by Testing, Adjusting, and Balancing such as static pressure and differential pressure setpoints.

R. Equipment Suppliers

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.
2. Assist in equipment testing per agreements with Contractors.
3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

**3.3 CxA'S RESPONSIBILITIES**

A. Roles and Responsibilities

1. Refer to DDC General Conditions Section "General Commissioning Requirements" for general CxA responsibilities.

B. Cx Team Meetings

1. Commissioning during the Construction Phase will begin with a 'Commissioning Kick-Off Meeting – for Construction Team' conducted by the CxA where the commissioning process is reviewed with all of the commissioning team members.
2. Additional meetings will be required throughout the Construction and Acceptance phases. The CxA shall attend select meetings related to commissioning as required by the DDC during the Construction and Acceptances phases.

C. Coordination and Scheduling

1. Coordinate and direct commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications, and consultations with all necessary parties.
2. Coordinate commissioning work with the Resident Engineer to ensure that commissioning activities are being scheduled into the master project schedule.
3. Coordinate with the Resident Engineer to witness tests, inspections, and systems startup.



**D. Commissioning Progress**

1. Perform periodic site visits to observe component and system installations, and qualify contractor completed checklists.
2. Report deficiencies to the Commissioner including but not limited to issues related to adequate accessibility required for component maintenance replacement and repair.
3. Review construction meeting minutes for revisions/substitutions relating to the commissioning process.

**E. Pre-Functional Checks**

1. Verify proper installation of components, equipment, systems and assemblies. Sampling procedures may not be employed on systems and equipment.
2. Pre-Functional checks for a piece of equipment shall only be started once the approved checklist for a piece of equipment has been received from the installing contractor indicating the equipment is ready to begin its pre-functional checks.
3. Team will not be allowed to move forward into functional testing until all Pre-Functional testing is completed and the team moves onto the Acceptance Phase for the project.

**F. Equipment and System Startup and Verification**

1. Review and approve component, equipment, system, and assembly startup plan developed and submitted by the Contractor.
2. Approve system startup by reviewing startup reports, if contracted; and by selected site observation.
3. Review the Testing, Adjusting and Balancing execution plan for the project, which shall be submitted by the TAB subcontractor.
4. Verify and document the accuracy of the air and water systems balancing by spot testing the air and water reported field values with TAB subcontractors and by reviewing completed reports.

**G. Functional Performance Testing**

1. With assistance from the Contractor, write Functional Performance Testing procedures for all components, equipment or systems to be commissioned.
2. With the assistance of the Contractors, coordinate Functional Performance Testing. Witness and approve Functional Performance Testing performed by the Contractors.
3. With the assistance of the Contractors, coordinate retesting as necessary until satisfactory performance is achieved.
4. Witness seasonal or deferred Functional Performance Testing as necessary.



H. Issue/Deficiency Logs

1. The CxA shall prepare a formal, ongoing, online record of deficiencies, problems and concerns – and their resolution – raised by members of the Commissioning Team during the Commissioning Process.
2. Issues will be recorded on an online Commissioning Issues Log for the contractors to resolve to the satisfaction of the Commissioner. Issues will be added by the CxA. Team members are required to post their own responses to issues pertaining to their work. Team members are required to respond to issues added to the list within five (5) working days of being added by the CxA.
3. Issues will be revisited one (1) time to verify that the proper corrections have been made.
4. When issues are resolved, they will be closed on the Issues Log by the CxA.

I. Operation and Maintenance Data

1. The CxA shall review of the documentation submitted by the Contractor as required by the Specifications for completeness and accuracy. This commissioning review supplements, but does not replace, the Commissioner's review.
2. Review equipment warranties.

J. Instruction

1. The Contractor will provide all documentation and qualified instruction personnel for instruction.
2. The CxA will verify through the Contractor's plan and schedule, instruction agendas, and select observations that proper instruction procedures were followed on all commissioned systems.
3. The CxA will verify that Instruction Video Recordings are executed, collected, and provided to the Commissioner and/or appropriate New York City Personnel.
4. See appropriate section below pertaining to instruction.

K. Systems Manual Requirements

1. Index of Systems Manual with notation as to content storage location if not in actual manual.
2. Executive Summary
3. A list of recommended operational record keeping procedures at the facility level, including sample forms, trend logs, or others, and a rationale for each.
4. Maintenance procedures, schedules and recommendations.
5. Ongoing Optimization
6. Other Attachments



**L. Post Occupancy Review**

1. The CxA will return to the site within the 12-month warranty period to address the following: review current building operations with facility staff and address outstanding issues related to the Owner's Project Requirements; Interview facility staff and identify problems or concerns with operating the building; Identify problems covered under warranty or under the original construction contract.
2. The CxA will make suggestions for improvements in the content of the O&M Manuals. Any required changes shall be made by the contractor responsible for that section.
3. The CxA shall assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

**M. Commissioning Final Report**

1. The CxA shall provide a final report following the completion of all Functional Performance Testing. The report is to outline compliance and non-compliance to the construction documents, as well as identify concerns relative to future performance

**3.4 TESTING PREPARATION**

- A. Certify in writing to the CxA that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing to the CxA that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.
- C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

**3.5 TESTING, ADJUSTING AND BALANCING VERIFICATION**

- A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.



- B. Notify the CxA at least ten (10) days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
  - 1. The CxA will notify 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.

### **3.6 GENERAL TESTING REQUIREMENTS**

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of HVAC&R testing shall include entire HVAC&R installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA along with the 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.

### **3.7 HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES**

- A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 23 sections. Provide submittals, test data, inspector record, and certifications to the CxA.
- B. HVAC&R Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls." Assist the CxA with preparation of testing plans.
- C. Refrigeration System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of 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.
- D. HVAC&R Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, steam, and hydronic distribution systems; special exhaust; and other distribution systems, including HVAC&R terminal equipment and unitary equipment.
- E. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- F. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:
  - 1. Chiller
  - 2. Chilled Water Pumps
  - 3. Energy Recovery Units
  - 4. HV Units
  - 5. Make Up Air Units
  - 6. Exhaust Fans
  - 7. Rooftop Units
  - 8. Condensing Boilers
  - 9. Hot Water Pumps
  - 10. Unit Heaters



11. Packaged AC Units
12. Split System - AC Units
13. Testing, Adjusting, and Balancing
14. Building Management System

### **3.8 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT**

#### **A. Deficiencies/Non-Conformance**

1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and Contractors on a standardized form.
2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the contract document in dispute or request further information to clarify the concern.
3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
5. As tests progress and a deficiency is identified, the CxA discusses the issue with the executing Contractor.
6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function.
7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.
8. Deficiencies that are not corrected at the time of documentation, shall be completed by the affected contractor and photo evidence of the deficiency resolution shall be sent to both the DDC Project Manager and the CxA.



**B. Failure due to Manufacturer Defect**

1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Contractor, CxA or Commissioner. In such case, the Contractor shall provide the Commissioner with the following.
  - a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
  - b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
  - c. The Contractor, CxA, or Commissioner will determine whether a replacement of all identical units or a repair is acceptable.
  - d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the CxA or Commissioner will decide whether to accept the solution.
  - e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

**3.9 APPROVAL**

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

**3.10 DEFERRED TESTING**

- A. Unforeseen Deferred Testing – If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Commissioner. These tests will be conducted in the same manner as the seasonal tests, as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate Contractors, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.



### **3.11 OPERATION AND MAINTENANCE MANUALS**

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in DDC General Conditions.
- B. The specific content and format requirements for the standard O&M manuals are detailed in DDC General Conditions. Special requirements for the controls Contractor and TAB Contractor are found in Division 23.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

### **3.12 INSTRUCTION OF CITY OF NEW YORK PERSONNEL**

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.
  - 1. The CxA shall interview the City of New York's staff to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor. Who will in turn communicate to the subcontractors and vendors who also have instruction responsibilities.
  - 2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by contractors, subcontractors and vendors are specified in the individual sections listed in Section 1.2 – Summary.
  - 3. Each Sub and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
  - 4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
    - a. Equipment (included in instruction)
    - b. Intended audience
    - c. Location of instruction
    - d. Objectives



- e. Subjects covered (description, duration of discussion, special methods, etc.)
  - f. Duration of instruction on each subject
  - g. Qualified instructor for each subject
  - h. Instructor qualifications
  - i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary HVAC equipment, the Controls Subcontractor shall provide a discussion of the control of the equipment during the mechanical or electrical instruction conducted by each subcontractor or vendor.
  6. Instruction documentation shall include the following items:
    - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
    - b. Copy of the Owner's Project Requirements.
    - c. Copy of the Basis of Design.
    - d. Compiled operations manuals.
    - e. Compiled maintenance manuals.
    - f. Completed manufacturer instruction manuals.
    - g. Red-lined drawings.
    - h. Other pertinent documents.
  7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending some of the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
  8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment
  9. Videotaping of the instruction sessions in DVD format will be provided by the CxA.

**END OF SECTION 23 08 00**



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**SECTION 23 09 00  
INSTRUMENTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Thermometers and Temperature Wells.
- B. Hydronic Pressure Gauges.
- C. Test Plugs.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit shop drawings of instrument display boards, along with other shop or field fabricated installations.
- C. Product Data: Submit manufacturer's latest published data for instrument types, materials, accessories and installation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Instruments are to be factory calibrated for the temperature and pressure of the systems in which they are installed.
- C. Instruments to be industrial quality.



**PART 2 - PRODUCTS**

**2.1 THERMOMETERS AND TEMPERATURE WELLS**

- A. Provide duct thermometers of the dial face type, 3" diameter, bimetal hermetically sealed. Accuracy is to be factory calibrated to  $\pm 1^\circ\text{F}$ , for the average temperature of the system in which it is installed. Construction to be stainless steel with external calibration adjustment.
- B. Provide pipe insertion thermometers of the 9" mercury red reading scale,  $2^\circ\text{F}$  increments separable socket, adjustable angle with brass stem. Provide the following socket lengths:

Pipe Size	Insertion Length
4" and 5"	2½"
6" and 8"	5"
10" and over	7"

- C. Provide pipe surface mount 2" diameter thermometers of the strap on, spring held type with insulating cup. Spring shall be stainless steel with thermoplastic seating cup and heat treated bimetallic sensor in accordance with ASTM bimetal TM-2.
- D. Provide thermometers with ranges as follows:
  - 1. Duct Systems:  $25^\circ$  to  $125^\circ\text{F}$ .
  - 2. Hot Water Systems:
    - a. Mercury:  $30^\circ$  to  $240^\circ\text{F}$
    - b. Dial:  $70^\circ$  to  $370^\circ\text{F}$
  - 3. High Temperature Hot Water Systems:
    - a. Mercury:  $100^\circ$  to  $600^\circ\text{F}$
    - b. Dial:  $70^\circ$  to  $500^\circ\text{F}$
- E. Manufacturers
  - 1. Weiss
  - 2. Trerice
  - 3. Taylor
  - 4. Ashcroft



5. Weksler
6. Or approved equal

## **2.2 PRESSURE AND COMPOUND GAUGES**

- A. Provide gauges of the bourdon tube type with minimum 4" dial and die cast aluminum case with black enamel finish. Gages shall have safety blow-out back. The movement to be all stainless steel with Grade A phosphor bronze bourdon tube brazed at socket and tip. Provide accuracy of the gauge within 1% of the scale range. The pointer will be the micrometer adjustment type recalibrated from the front.
- B. Pressure gauges installed at pumps shall be liquid-filled type.
- C. Provide needle-type isolation valves at each pressure gauge.
- D. Manufacturers
  1. Weiss
  2. Trerice
  3. Taylor
  4. Ashcroft
  5. Weksler
  6. Or approved equal

## **2.3 TEST PLUGS AND KITS**

- A. Provide test plugs 1/2" NPT made of brass body and cap with rubber EPDM core.
- B. Provide six (6) gauge kits consisting of:
  1. (1) 1/4" NPT pressure gauge with minimum 4" dial face with a range of 0 psi to 150 psi,
  2. (1) 1/4" NPT compound gauge with minimum 4" dial face with a range of - 15 psi to +30 psi,
  3. (2) Ball valves, (1) needle valve, (3) 1/4" coupling adaptors, (3) 1/2" x 1/4" bushings,
  4. (3) 3/4" x 1/4" bushings, (3) 3 foot long flexible hoses with female threaded swivel couplings, auxiliary test cock, (1) stainless steel 1" dial face stem thermometer minimum 4" long with a range of 0° to 220°F, (1) adjustable angle stainless steel stem thermometer with minimum 3" dial face with 4" stem with a range of 0° to 250°F.
  5. A shock resistant molded plastic case with foam inserts and carrying strap.



C. Manufacturers

1. Test Plugs

- a. MG Piping Products
- b. Ernst
- c. Weksler
- d. Texas Fairfax
- e. Or approved equal

2. Test Kits

- a. Gage IT, Inc.
- b. Tel Tru
- c. PTC
- d. Weksler
- e. Weiss
- f. Or approved equal

**PART 3 - EXECUTION**

3.1 Provide local panel for mounting of duct thermometers located next to air handler which it serves. Locate panel so that length of capillary tubing is held to a minimum. Mount panel on kindorf fastened securely to structure. Thermometers to be provided in each system as follows as necessary on the project:

- A. Upstream of each heating coil bank. Range 0 – 100F
- B. Downstream of each heating coil bank. Range 0 – 160F
- C. At each return air fan inlet. Range 0 – 100F
- D. At each supply air fan discharge. Range 0 – 160F
- E. At each supply air fan inlet. Range 0 – 160F
- F. At each outside air intake. Range – 40 to 160F
- G. Where shown on Contract Documents.

- 3.2 Provide pipe thermometers and thermometer wells in the inlet and outlet at each of the following locations as necessary on the project:
- A. Hot water boiler.
  - B. Where shown on the Contract Documents.
- 3.3 Test plugs to be provided at inlet and outlet of each water coil (including unit heaters, cabinet heaters, fan coil units, etc.).
- 3.4 Provide pressure gauges at the following locations as necessary on the project:
- A. Upstream and downstream of all coils, strainers, controls valves and pumps, heat exchangers, refrigeration machines (evaporator condenser, hot water generator), steam boiler, cooling tower.
  - B. Hot water header leaving the boiler plant.
  - C. Where shown on contract drawings.
- 3.5 Provide air pressure gauges at the following locations.
- A. Upstream and downstream of all filter banks, coils.

**END OF SECTION 23 09 00**



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**SECTION 23 09 23  
BUILDING MANAGEMENT AND CONTROL SYSTEM (BMCS)**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].
- B. Provide a complete, fully integrated Building Management and Control System (BMCS) utilizing direct digital control for energy management, equipment monitoring and control, and subsystems with open communications capabilities in accordance with the contract documents.
- C. The contractor shall fully coordinate his work with the equipment specified and supplied under other specification sections. A review of all equipment schedules located on the contract drawings shall be performed. Coordinate this information with the actual approved equipment cuts/submittals. Provide all components required to interface with the equipment as called for in the contract documents. The contractor shall detail, layout, and provide all components required for the BMCS criteria for each piece of equipment. The contractor must pay particularly close attention to areas which call for direct network integration, through the utilization of standard protocols, to devices furnished under other specification sections.
- D. Provide an open protocol communications system. The system shall be open with the capabilities to support a multi-vendor environment. The intent is for all distributed controllers down to the terminal level to reside on an open protocol network. To accomplish this effectively, system shall be capable of utilizing standard protocols as follows as well as be able to integrate third-party systems via existing vendor protocols.
1. The BMCS shall utilize high speed Ethernet communication using BACnet, LonTalk, Modbus or approved equal over IP protocol at the Management Level and Automation Level networks.
  2. System shall be capable of BACnet, LonTalk, Modbus or approved equal communication according to ANSI/ASHRAE 135-2012.
  3. System shall be capable of OPC, SOAP, SNMP, XML or approved equal server communications.
  4. The system shall be also capable of supporting a range of vendor specific protocols to enable interoperability between a variety of existing and future third-party devices and legacy systems.



5. System shall be capable of communication SNMP, SOAP, XML, and Web Services.
  6. Communication protocol manufacturers shall be as above or approved equal
- E. The entire system shall be BACnet, LonTalk, Modbus BTL listed or approved equal.
- F. The BMCS shall be Direct Digital Control with electric actuation as specified herein.
- G. The contractor shall distribute 120 VAC power to all BMCS components, as necessary, from designated circuit breakers furnished by the Contractor. This includes all equipment and devices supplied by the contractor, except where specifically called for otherwise, including control panels, transformer panels, data gathering panels, actuators, thermostats, etc. Power may be reduced from 120 volt to 24 volt via a transformers provided and installed by the contractor and run to application specific controllers in lieu of 120 VAC. The contractor shall also provide all data cabling, conduit risers, and all layout work as required for the complete installation of the BMCS. Provide sleeves for the fire-stopping at all cores, walls, and slabs, in accordance with the project schedule and contract documents. All controlling and signal power (e.g. 0-10vdc, 4-20 mA, control and status, feedback wiring, etc.) shall be installed by this contractor.
- H. Provide a dedicated BMCS communications network including all required communication cabling, network switches, media converters, routers, repeaters, gateways, and electric isolation for processors and protection from electrical interference.
- I. The communication network shall be designed in a ring topology such that in the event of a cable path or switch failure, the network will remain fully operational and shall self-heal within 300ms to use the alternate cable/switch path.
- J. The BMCS network "backbone" shall reside on the converged core building network to be installed by the Contractor. The Contractor shall distribute communications from network ports provided by the Contractor to BMCS equipment. Provide the necessary coordination with the IT section.
- K. A dedicated fiber optic network riser shall be installed by the Contractor for the BMCS. The Contractor shall provide network service panels for connection to the network riser and distribute communications to BMCS equipment as required.
- L. Miscellaneous wiring required for control devices and equipment provided by others shall be provided by the contractor furnishing the equipment.
- M. Provide all miscellaneous field device mounting and interconnecting wiring for all mechanical systems including but not limited to: boilers and boiler control system, variable refrigerant flow (VRF) control system, water treatment, AC units condensing units, VFD.
- N. All systems requiring interlock wiring shall be hardwired interlocked and shall not rely on the BMCS to operate (e.g. emergency generator to fuel oil pump interlock, emergency generator damper interlock, safety shutdowns, etc.) Interlock wiring shall be run in separate conduits from BMCS associated wiring.
- O. Provide all necessary permits, applications, filings and associated fees which may be required to perform the work called for in the contract documents.



## 1.2 WORK INCLUDED

- A. The work under this Section of the specifications includes all labor, materials, wiring, equipment and services to provide a complete and fully operational BMCS in strict accordance with these specifications and the contract drawings and subject to the terms and conditions of the contract. The work in general consists of, but is not limited to, the following:
1. BMCS Server(s) for database management to be located as indicated on contract documents or as coordinated with the City of New York.
  2. One Operators Work Station(s) (OWS) consisting of a personal computer, 24" flat panel LCD monitor, and printer to be located as indicated on contract documents or as coordinated with the City of New York.
  3. Two Portable local operator's terminal(s).
  4. A dedicated data communications network including required cabling, network switches, media converters, routers, repeaters, gateways, and electric isolation for processors and protection from electrical interference.
  5. BACnet BTL Listed Building Controllers, communicating BACnet/IP or Ethernet in a peer-to-peer fashion for all major HVAC equipment including central heating and cooling equipment, Air Handling Units, Roof Top Units, etc.
  6. BACnet, LonTalk, Modbus or approved equal BTL Listed Application Specific Controllers and Advanced Application Controllers for all terminal unit equipment including VAV boxes, Fan Coil Units, Induction units, Unit Ventilators, etc.
  7. Complete electrical installation including wiring, conduit, raceways and power wiring, except as noted.
  8. Software:
    - a. All software licenses, original installation disks, manuals, service packs, etc., utilized to install, configure and operate systems. All software licenses shall be the property of the City of New York and shall be so assigned upon substantial completion of the project.
    - b. All programming routines, configuration files, utilities, etc. created specifically for the project. These include controller software & configuration utilities to implement the sequence of operations, GUI graphical screens, VB scripts, XML scripts, etc. Any compiled controller software resident in field controllers shall be supplied in its un-compiled format for future utilization by the City of New York.
    - c. System backups on CD to facilitate project software restoration.
  9. BMCS equipment or platform capable of providing industry standard open protocol communication (BACnet, LonTalk, Modbus, OPC, SOAP, SNMP, XML or approved equal) capability to other building systems.



10. Full documentation for all software and equipment provided.
11. Project management for managing system installation including, but not limited to:
  - a. Creation of the building management system for implementation purposes, installation, equipment delivery, coordination with other trades (as applicable) and acceptance testing.
  - b. Provide manpower as necessary for assisting in the testing and commissioning of systems included in this specification and the contract documents (as related to the BMCS). These systems shall include but not be limited to the following:
    - 1) Fire Alarm System
    - 2) HVAC Systems (Air Conditioning Systems, Fans, pumps, motors, etc.)
    - 3) Boilers
12. Miscellaneous work as indicated in these specifications and the contract drawings.
13. Miscellaneous wiring as specified herein. All wiring associated with the installation of the BMCS and associated systems/equipment provided under this project's scope of work including but not limited to the following:
  - a. BMCS power, communication, and control devices including actuators and sensors.
  - b. Data cables to buildings, Direct Digital Control and Processing Units, etc.
  - c. Communication cabling to City of New York's Internet, Intranet, or Extranet services for remote communications.
  - d. Smoke control system from dry contacts or via standard communication protocol (provided by the contractor) to the Direct Digital Control and Processing Units as required affecting the smoke control sequences.
  - e. Smoke dampers and smoke damper end switches for HVAC system interlocks provided by contractor. Fire Smoke Damper end switches for HVAC system interlocks provided by contractor. Smoke damper and Fire Smoke damper actuator wiring by Division 26.
  - f. Wiring of each make-up water controller, including 120VAC power and control wiring.
  - g. Fuel oil system control and interlock wiring.
  - h. As a general rule, with the exception of the items above, if a device is furnished under this section, this section to provide all wiring and required conduit, rough in, etc. as required for installation of the device.
14. Complete operating and maintenance manuals and field training of operators and maintenance personnel.



15. System commissioning and acceptance tests as specified.
16. Provide service kit.

**1.3 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION**

- A. Installation of the following items furnished under this Section but installed under Division 23 Mechanical.
  1. Automatic Control Valves
  2. Temperature Sensor Wells (thermowells) and Sockets
  3. Air Flow Measuring Stations
  4. Liquid Flow Sensors
  5. BTU Meters (inline type only, strap-on ultrasonic to be installed by contractor)
  6. Liquid Flow Switches
  7. Refrigerant Pressure Sensors
  8. Factory Mounted direct digital control type controls and sensors.
- B. Supervise and coordinate the installation of equipment, instruments and materials furnished under this Section but installed under other Divisions of the specifications. All equipment and instruments shall be installed in strict accordance with the manufacturer's published installation instructions.

**1.4 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION**

- A. Refrigerant leak detection system.
- B. Packaged AC unit wall thermostats, local alarm panels.
- C. Accessories of other packaged systems as listed under the Sequence of Operation section.

**1.5 PRODUCTS INTEGRATED TO BUT NOT FURNISHED OR INSTALLED UNDER THIS SECTION**

- A. Boilers
- B. Variable Frequency Drives
- C. Factory Packaged Units
- D. Fire Alarm System
- E. Heat Trace Control System



## 1.6 RELATED SECTIONS

A. The following sections constitute related work:

1. 23 02 00 Fire Stopping
2. 23 05 13 Electric Motors
3. 23 05 53 Systems Identification
4. 23 05 93 Testing Adjusting Balancing
5. 23 33 13 Dampers
6. 23 85 00 Variable Frequency Controllers
7. 28 31 00 Fire Alarm – Life System

## 1.7 SYSTEM DESCRIPTION

A. System Configuration

1. The Building Management and Control System (BMCS) shall perform both monitoring and control of HVAC and electrical equipment for building management, energy conservation, and environmental control.
2. The BMCS control philosophy to be direct digital control and be implemented by a microprocessor based, distributed direct digital control system.
3. The entire BMCS shall be BACnet, LonTalk, Modbus or approved equal BTL Listed.
4. Operator workstation software shall be BTL Listed as Advanced Workstations Software.
5. All field panels controlling each individual AHU, RTU, Chilled water or Heating water distribution plants, and exhaust fans shall be BACnet, LonTalk, Modbus or approved equal BTL Listed Building Controllers.
6. All application specific controllers responsible for control of VAV boxes, fan coil units, fan powered boxes, unit ventilators, radiators, unit heaters shall be BACnet, LonTalk, Modbus or approved equal BTL Listed Application Specific Controllers.
7. Advanced Application Controllers and Application Specific Controllers shall not be used to control RTU's, AHU's; Chilled and Hot water plants.
8. The system shall have an open protocol with the capabilities to support a multi-vendor environment. To accomplish this effectively, the BMCS shall be capable of directly utilizing industry standard open communication protocols as well as be able to integrate third-party systems via existing vendor protocols. The system shall also be capable of supporting a wide range of vendor specific protocols,



either directly or via gateway, to enable interoperability between a variety of existing and future third-party devices and legacy systems.

9. The system shall utilize high speed Ethernet communication using BACnet, LonTalk, Modbus or approved equal over IP protocol at the Management Level and Automation Level networks.
10. The system shall be capable of BACnet, LonTalk, Modbus or approved equal communication according to ANSI/ASHRAE Standard 135-2012.
11. The system shall be capable of OPC server communications.
12. The system shall be capable of using BACnet, Modbus, LonTalk or approved equal protocols.
13. System shall be capable of communication SNMP, SOAP, XML, and Web Services.
14. The installed Client consoles (workstations) shall provide a user interface for overall building data acquisition and transfer, report and alarm generation, historical data retrieval, and operator interface.
15. The system server(s), operator workstation(s), and Direct Digital Control and Processing Units to communicate through dedicated Ethernet communications network in a peer-to-peer fashion. All communications on network shall be by digital signals only. System design shall eliminate dependence upon any single device for alarm reporting and control execution. The failure of any single component or network connection shall not interrupt the execution of any control strategy, reporting, alarming and trending function, or any function at any operator interface device.
16. The BMCS communication network layout shall be engineered by the contractor to fully comply with the intended design within the manufacturers' network guidelines.
17. A new BMCS communications network shall be installed in parallel with the existing BMCS communication network, complete with the operator's workstation(s) during the initial stage of construction. As the project advances, the Direct Digital Control and Processing Units shall be installed adjacent to the existing Direct Digital Control and Processing Units. When the air handler is demolished, the existing BMCS controller shall likewise be demolished. When the new AHU is set, the contractor shall install new sensors, and wire back to new controller.
18. The Direct Digital Control and Processing Units to perform remote data acquisition and process control. Direct Digital Control and Processing Units shall be locally mounted completely self-contained, field programmable, real-time microprocessor based controllers capable of stand-alone operation. The Direct Digital Control and Processing Units Controllers shall be able to access any data from, or send control commands and alarm reports directly to, any other Direct Digital Control and Processing Units Controller or combination of controllers on the network without dependence upon a central or intermediate processing device.
19. Each Direct Digital Control and Processing Unit to be connected to its particular controlled environment through field I/O instrumentation.

**B. Design and Performance Criteria**



1. Expansion Capability:
  - a. The system's built-in capacity shall include licensing for not less than 50% spare software points (objects) with no hardware changes required, except the addition of Direct Digital Control and Processing Units (I/O) and communication network extensions.
  - b. System shall be modular in design, to allow change of function and operation in the field by adding plug-in module equipment and software changes to expand system capacity while maintaining full on-line operation.
  - c. Provide 20% spare capacity (or a minimum of one, whichever is greater) of each type of I/O point (BI, BO, AI, AO) in each controller
2. Response Time:
  - a. Time between occurrence of alarm, status change or change of value and its processing, display or printout shall not exceed 10 seconds irrespective of other system activities.
  - b. Time between an operator's command and the associated system output shall not exceed the following times irrespective of other system activities.
    - 1) Point Command (Start Stop, Setpoint, etc.) 5 seconds
    - 2) Log Request 10 seconds
    - 3) Graphics Request 10 seconds
    - 4) Program or Database Modification 60 seconds
3. Provide stable control of all connected systems with a closed loop control accuracy not to exceed:
  - a. Space Temperature:  $\pm 2$  Degrees
  - b. Duct Temperature  $\pm 1.5$  Degrees
  - c. Humidity:  $\pm 5$  percent
  - d. Fluid Pressure:  $\pm 1.5$  PSI (0 to 150 PSI Range)
  - e. Air Pressure:  $\pm 0.2$ " wg (0 to 6" span)
  - f. Flow:  $\pm 1$  percent of sensor span
4. Environmental Conditions:
  - a. The Direct Digital Control and Processing Units, Field Equipment Panels, and other equipment shall operate under ambient environmental conditions of 32° to 122°F dry bulb and less than 93% relative humidity, noncondensing as a minimum. Sensors and control elements shall operate under the ambient environmental temperature, pressure, humidity, and vibration conditions



encountered for the installed location. For locations requiring the use of a Direct Digital Control and Processing Unit mounted in the controlled equipment, such as a rooftop unit, an extended temperature range unit shall be used capable of operating from -40° to 158°F and less than 93% relative humidity, noncondensing as a minimum.

- b. Other equipment, such as CPU, monitors and printers, shall, unless designated otherwise, operate properly under ambient environmental conditions of 50° to 95°F and a relative humidity of 10% to 95%.
5. Materials and Equipment:
- a. Where multiple units of the same type are required, the units to be products of a single manufacturer. However, the component parts of the system need not be the products of a single manufacturer. The components shall not require customizing other than setting jumpers and switches and adding firmware. Each major component of equipment shall be labeled with the manufacturer's name, address, model and serial number.
  - b. All systems and components shall have been thoroughly tested and proven in actual use.
6. Total system shall be immune to internal and external generated sources of electrical noise.
7. Remote Capability:
- a. The BMCS shall provide a Web-based graphical interface that allows users to access the BMCS via the Internet, Extranet, or Intranet provided the appropriate security protocols are met. Functionality of web-based clients shall provide the same user interface provided by installed client consoles (operator workstations).
  - b. The BMCS shall provide remote alarm notifications to a minimum of ten (10) Building Operations Personnel via phone, text message, and email.
  - c. Internet connections, ISP services, as well as necessary firewalls or proxy servers shall be provided by the City of New York as required to support the Web access feature.
  - d. When the BMCS is placed "On Line", Commissioner shall be given (read only) access to the system via the Internet.

## **1.8 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. General
  - 1. Provide a single submittal package that includes all required information relevant to the BMCS portion of this project. Partial submittals shall not be accepted except when required to accommodate the construction schedule.



2. Indicate at the beginning of each submittal, known deviations from requirements of Contract Documents. Provide a marked up specification with "Comply" or "Don't Comply" next to each paragraph. If "Don't Comply" is noted, state how that requirement will be met.

**C. Product Data**

1. Provide technical bulletins and catalog data for all equipment and system components. Clearly identify, by use of symbol or tag number, the service of each item. All relevant information shall be noted (e.g. – using arrows, boxes, etc.) and/or irrelevant information shall be marked out leaving only pertinent data for easy identification.
2. Number all pages of the data sheet section and provide a table of contents so it is simple to locate specific items without needing to page through multiple data sheets.

**D. Shop Drawings**

1. Shop drawing submittals to include sufficient data to indicate complete compliance with Contract Documents. Submissions in form of drawings, brochures, bulletins, catalog data, and/or narrative descriptions. As a minimum requirement submit:
  - a. Symbol and abbreviation lists including standard installation details.
  - b. System block diagram showing quantity and location of Operator's Work Stations (OWS), printers and all Work Station Equipment, Direct Digital Control and Processing Units, Field Equipment Panels, physical communication cable routing between system components, sources for all power to each device (other than final control devices) and coordinated location of all major system components.
  - c. Network riser and communication map indicating all network resident devices including but not limited to Server(s), OWs, Direct Digital Control and Processing Unit controllers, unitary controllers, intelligent sensors & actuators, switches, routers, repeaters, gateways, connectivity to packaged systems, connectivity to integrated systems, etc. If the project scope of work includes the expansion of an existing system, the existing components shall be shown on the riser diagram as well. The existing components to be detailed in light gray, dotted or some other fashion to delineate that the components are existing.
  - d. Interfaces (software and hardware) with equipment provided in other sections of specifications. Show connection details based upon the approved submittals of the equipment being interfaced with. Comments such as "information to be completed with As Built Documentation" will not be acceptable.
  - e. Narrative description of operation for each system, enumerating and describing the function of each component. Include alarm and emergency sequences, and equipment interlocks.
  - f. Description of manual override capabilities.
  - g. Complete input output point schedule. Identify point function, range, type, and location.



- h. Spare capacity provisions.
  - i. Detailed bill of materials.
  - j. Valve and Damper Schedule: Provide identification numbers, location, system, dimensions and performance data. Damper schedule shall be based upon approved sheet metal shop drawings. Schedule shall show damper leakage rates. Valve sizing shall be based on approved equipment cut sheets and approved piping shop drawings.
  - k. Device mounting details. Include as a minimum:
    - 1) Sensing elements in ducts or casings.
    - 2) Sensing elements in piping.
    - 3) Freezestats mounted in factory assembled Air Handling Units
  - l. Ladder wiring diagrams.
    - 1) All panel to field wiring shall be illustrated in ladder wiring diagrams, especially from the field terminals to the panel terminals. Spreadsheets or details that have to be assembled to determine circuitry will not be accepted under any circumstances.
  - m. Data maps for network integrated components, indicating parameters and data being shared amongst systems.
  - n. Other information as requested herein.
2. Complete full-size drawings, 11 in. x 17 in. minimum. Each system shall be submitted separately. Do not submit "typical" system as one drawing unless the systems depicted are identical with the exception of Direct Digital Control and Processing Unit point addresses. In such cases, provide a schedule on the drawing with rows and columns for each device in each system detailing part numbers, point addresses, etc.
- E. Programming
- 1. Point identification code.
  - 2. System advisory messages, printouts, logging formats.
  - 3. Drawings of system graphics showing monitored points.
  - 4. Software flow charts for application and Direct Digital Control and Processing Unit programs.
  - 5. Person machine interface program, include commands, alarm annunciation, logs and programming capabilities.
  - 6. Listing of all alarm messages (with their text) to be programmed for each alarm specified. Messages shall require system operator's or commissioner's approval.



7. Description of system operation under failure conditions, including restart sequences and hierarchy for all systems.

F. Samples

1. Provide samples of the following wall mounted devices.
  - a. Thermostats
  - b. Temperature sensors
  - c. Humidistats
  - d. Humidity sensors
  - e. Carbon Dioxide Sensors
2. All devices mounted on finished surfaces.

G. Quality Control Submittals

1. U.L., BTL, FM, CSA listing compliance certificates.
2. Final calibration, commissioning and testing reports.

**1.9 EQUIPMENT OPERATION MANUALS**

A. General

1. Submit 2 draft copies of equipment manuals for review. After review by the Commissioner, the contractor shall incorporate review comments and submit two (2) final paper copies and two electronic copies in portable document format (.pdf) on DVDs/CDs.
2. Update manuals with modifications made to system during guarantee period. Provide replacement pages or supplements in quantity stated above.
3. Assemble equipment manuals into multi-volume sets as necessary and required by the City of New York. Refer to DDC General Conditions.
4. Protect each volume with a heavy-duty vinyl plastic binder. Volumes to have plastic printed dividers between major sections and have oversized binders to accommodate up to 1/2 inch thick set of additional information.
5. Each binder to be printed with project name and volume title on front cover and binder.
6. On the first page of each manual identify with project name, manual title, Agency's name, Commissioner's name, contractor's name, address and service phone number, and person who prepared manual.



- B. Operating manual to serve as instruction and reference manual for all aspects of day-to-day operation of the system. As a minimum include the following:
1. Control flow diagrams.
  2. Sequence of operation for automatic and manual operating modes. The sequences shall cross-reference the system point names.
  3. Description of manual override operation of control points.
  4. System manufacturers complete operating manuals.
- C. Provide maintenance manual to serve as instruction and reference manual for all aspects of day-to-day maintenance and major system repairs. As a minimum include the following:
1. Complete as-built installation drawings for each system.
  2. Overall system electrical power supply scheme indicating "as-built" source of electrical power for each system component. Indicate which components are on emergency power and indicate all battery backup provisions.
  3. Overall system shielding and grounding scheme indicating all major components and ground paths.
  4. Photographs and drawings showing installation details and locations of equipment.
  5. Charts showing normal operating conditions at significant points such as electrical test points.
  6. Routine preventive maintenance procedures, corrective diagnostic troubleshooting procedures, and calibration procedures.
  7. Parts lists with manufacturer's catalog numbers and ordering information.
  8. Lists of ordinary and special tools, operating materials supplies and test equipment recommended for operation and servicing.
  9. Manufacturer's operating set up, maintenance and catalog literature for each piece of equipment.
  10. Maintenance and repair instructions.
  11. Recommended spare parts.
  12. Field test reports.
- D. Provide Programming Manual to serve as instruction and reference manual for all aspects of system programming. As a minimum include the following:
1. Complete programming manuals, and reference guides.
  2. Details of any special software packages and compilers supplied with system.



3. Information required for independent programming of system.
4. Documentation on application and Direct Digital Control and Processing Unit programs: Flow charts, equations, and parameters.
5. Point schedule; include all points, real and virtual.
6. Software troubleshooting procedures.

#### **1.10 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Contractor shall meet the following qualifications:
  1. Have a minimum of 3 years of demonstrated technical expertise and experience in the installation and maintenance of Direct Digital Control Systems similar in size and complexity to this Project.
  2. The BMCS system shall be designed and installed, commissioned and serviced by factory trained personnel.
  3. Have maintained a service organization consisting of at least three competent service technicians, within proximity of this project, for a period of not less than three years.
  4. Systems Manufacturers for this project shall be:
    - a. Honeywell
      - 1) Product Line: EBI Enterprise Building Integrator.
      - 2) Acceptable Direct Digital Control and Processing Unit: Excel Web II Building Controller with direct Ethernet I/O Control in a peer-to-peer BACnet, LonTalk, Modbus or approved equal IP environment (Peer to Peer, standalone Direct Digital Control BACnet/IP BTL Listed Building Controller).
- C. 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.
- D. Future compatibility shall be supported for no less than 10 years. Compatibility shall be defined as the ability to upgrade existing field panels to current levels of technology, and extend new field panels on a previously installed network. Compatibility shall be defined as the ability for any existing field panel microprocessor to be connected and directly communicate with new field panels without bridges, routers, or protocol converters.
- E. The Contractor shall provide an experienced Project Manager for this work, responsible for direct supervision of installation and startup of the system.
- F. Comply with all requirements of NFPA, UL, and BTL



- G. Due to the nature of rapid change in manufacturer specifications and BMCS software operating system requirements, submit a detailed BMCS system hardware and software specification conformance statement sheet clearly indicating deviations from the specification.

#### **1.11 WORK PERFORMANCE SCHEDULE**

- A. A time-phased schedule for delivery, installation, and acceptance of components for the complete system shall be prepared in accordance with the requirements of the Contractor. Submit this schedule to the Contractor or commissioner within thirty (30) days after award of contract. Submit updates and changes to this schedule promptly to the Commissioner.

#### **1.12 GUARANTEE**

- A. The Contractor shall guarantee the BMCS to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during Guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.
- B. The Contractor shall also provide necessary preventive maintenance on the server(s) and operator console(s) during the guarantee period. Provide updates to operator workstation software, project-specific software, graphic software, database software, and firmware that resolve Contractor identified software deficiencies at no charge during guarantee period. Do not install updates or upgrades without City of New York's written authorization.
- C. The contractor shall respond to service calls within four hours of the call either in person or through the remote log-in capabilities of the system. If the problem cannot be rectified remotely, a physical presence shall be made within eight hours of the initial call.
- D. The contractor shall update O&M manuals and system software backups to reflect any corrective measures taken during the guarantee period, which impact the hardware, software or system configuration.

#### **1.13 OWNERSHIP OF PROPRIETARY MATERIAL**

- A. Project specific software and documentation shall become the City of New York's property. This includes, but not limited to:
  - 1. Graphics
  - 2. Record drawings (Linked to system as-builts)
  - 3. Database
  - 4. Application programming code
  - 5. Programming Tools



6. Graphics modification tools
7. Database editing tools

## **PART 2 - PRODUCTS**

### **2.1 BMCS SERVER**

- A. Provide one (1) enterprise level fault tolerant server for system network and database management functions. All real-time control functions shall be resident in the Direct Digital Controllers to facilitate greater fault tolerance and reliability.
- B. Provide a Dell PowerEdge desktop, HP, Acer or approved equal with hardware and software specifications that are recommended by the BMCS manufacturer for optimal system performance. Final approval of the BMCS server shall be determined by the City of New York and Commissioner prior to installation. Minimum requirements shall be as follows: Intel Xeon 2.20 GHZ processor, AMD or Qualcomm or approved equal, 2 x 600 GB SAS 6Gbps 3.5 in. hot-plug (swappable) hard drives, RAID 1 Configuration, DVD-RW Drive, 32 GB RAM, Keyboard, Mouse, 1 Gbps Ethernet Card, Dual Hot-Plug redundant power supply, Windows Server 2012 R2 Standard Edition (64-Bit), Microsoft SQL Server (64-Bit) with SP2, Windows Internet Explorer, Antivirus software, System recovery media.
- C. Locate the BMCS Server in a clean, secure, dry and temperature controlled environment. Server shall be located as indicated on the contract documents or as coordinated with the City of New York.
- D. The server shall reside on the same BACnet, LonTalk, Modbus or approved equal IP protocol network as the System Controllers.
- E. Provide all necessary mounting hardware and cables for all components.

### **2.2 OPERATOR WORKSTATION (OWS)**

- A. Provide one (1) operator workstation console as the interface for the day-to-day operation including command entry, information management, alarm management, reporting, and interface with the system servers.
- B. Provide a personal computer with hardware and software specifications that are recommended by the BMCS manufacturer for optimal system performance. Final approval of OWS shall be determined by the City of New York and Commissioner prior to installation. Minimum requirements shall be as follows: 16 GB RAM, hard drive of 320 GB available space, with a video card with 256 MB RAM capable of supporting a minimum of 1920 x 1080 resolution with a minimum of 32 Bit color, DVD-RW Drive, mouse and 101-key enhanced keyboard. OWS shall be a Windows 7 64-bit (or later), and shall include a dual core processor or better.



- C. Provide a wide screen, active matrix LCD, flat panel type monitor that supports a minimum display resolution of no less than 1920 × 1080 pixels, Energy Star compliant 32-bit color. The display shall have a minimum of 24-inch visible area in diagonal measurement. Separate controls shall be provided for color, contrasts and brightness. The screen shall be non-reflective.
- D. Provide a full color, high speed, high resolution, and energy efficient printer with high speed USB and built in Fast Ethernet connectivity. System printer shall be Hewlett Packard, Canon, Epson LaserJet or approved equal. The printer model/version shall be the most up to date available at the time of submission. Provide a set of replacement cartridges at the time of substantial completion.
- E. Locate the OWS consoles in a clean, secure, dry and temperature controlled environment. OWS consoles shall be located as indicated on the contract documents or as coordinated with the City of New York.
- F. The Operator Workstations shall reside on the same BACnet, LonTalk, Modbus or approved equal IP protocol network as the System Controllers.
- G. Provide software licenses for interfacing to the BMCS. Load software, configure and setup for viewing the BMCS system.
- H. Provide all necessary mounting hardware and cables for all components.
- I. Provide integrated sound card and speakers for the annunciation of audible alarms or pre-recorded messages.
- J. All BMCS operator workstations shall have , at minimum, the following functionality: Graphics editing, Graphics generation, Program editing, Program generation, Point database editing, Point database generation, System backup, Trend editing, Trend retrieval, Alarm editing, Alarm retrieval.

### **2.3 PORTABLE LOCAL OPERATOR'S TERMINAL (LOT)**

- A. Provide two local operator's terminals (LOT) to allow local programming, control and monitoring at each Direct Digital Control and Processing Unit. LOT shall be a fully configured laptop computer. Operating system shall be the same as provided with the Operator's Work Station.
- B. Provide a laptop computer with the following minimum performance requirements: Intel Core i5 or comparable, 8GB of RAM, DVD-RW Drive, 238 GB hard disk drive, 10/100/1000 Network Card, Minimum display resolution of 1920 × 1080 pixels, Built-in WiFi and Bluetooth, carrying case, power supply and cables. Provide software licenses for interfacing to the BMCS. Load software, configure and setup for viewing the BMCS system.

### **2.4 ACCESSORY SOFTWARE**

- A. Provide up to date versions of the software as described below for all Client installed consoles. Software shall include original discs, CDs, manuals and site and/or individual licenses.
- B. Provide the following: Operating System Software, Antivirus Software, Microsoft Office Professional including Word and Excel, Internet Explorer or equal browser, Acrobat PDF Reader, CAD Viewer, PC Anywhere or terminal services, Peripheral software as required for printer, graphics generation, system backup, recovery, and restore, etc.



- C. Set up an icon on the desktop to take the User directly to the BMCS system login page.

## **2.5 PRIMARY ETHERNET NETWORKING**

- A. Fiber Optic Networking (Direct Digital Control and Processing Unit and Personal Computer Network)

1. Fiber optic cable (data transmission) shall meet, at minimum, the following requirements:
2. 50 micron core (multi-mode/single mode fiber as necessary to match the fiber provided by the Contractor).
3. 850 nm or 1300 nm LED compatible operation, as required.
4. A Minimum 125 micron cladding.
5. A Maximum attenuation of 4.5 db/km (850 nm).
6. Outdoor and below grade Fibers shall be run a gel-filled tube to protect against moisture and micro-bending. Tube mid Fiber shall have an armored braid surrounding, with suitable outside protective jacketing.
7. Cable shall contain 100% more Fibers than required for a single point-to-point communication connection.
8. Outdoor Fiber shall be equipped with a central non-conducting member for long pull applications.
9. Fiber optic cable shall comply with ANSI/TIA/EIA-862 (Building Automation Systems Cabling Standard for Commercial Buildings)
10. Fiber Optic cable shall be run in conduit.

- B. Ethernet Networking (Direct Digital Control and Processing Unit and Personal Computer Network)

1. Provide Category 6a (CAT-6a) Ethernet cable between Network Service Panels (NSP) and all Building Controllers responsible for AHU, chilled and hot water systems.
2. Ethernet cable shall be run in conduit.

- C. Network Service Panel (Fiber and Ethernet Switch Housings)

1. Network Service Panels shall be provided by the contractor as required throughout each building to route fiber optic network between buildings or within buildings with network runs exceeding 300 feet. Route Ethernet CAT-6a cable directly to all Building Controllers from each NSP
2. Communications between fiber panel and BMCS Building Controllers, mounted at each HVAC unit, are provided by 100-Base-TX Cat-6a Ethernet connections.
3. Communications between each PC (Server/Clients) and the fiber ring are provided by 1000-Base-TX Cat 6a Ethernet connections



4. UPS shall be contained within each Network Service panel
5. Fiber/Ethernet Switch:
  - a. Ethernet switches shall be managed industrial class switches by Cisco, Husky, Linksys, or approved equal.
  - b. Switches shall be provided with management capabilities including but not limited to: web browser, Telnet, SNMP or approved equal.
  - c. Ethernet switches shall be powered by local din-rail mounted DC power supplied contained within the Network service panel.
  - d. Provide Network Service Panels as located on system riser diagram (if provided) or as designed by the contractor and fully comply with the intended design within the manufacturers network topology guidelines. Network Services Panel (NSP) shall house the fiber switch and interface from Cat-6 Ethernet network to the redundant fiber ring. Network services panel shall be Siemens CP-567, Honeywell, Schneider Electric or approved equal with key lock or approved equal.
  - e. Each NSP shall contain its own DC power inverter. A service switch and duplex receptacle shall be provided in each panel.
  - f. Each NSP shall contain a SIECOR fiber optic patch panel.
  - g. Each Ethernet switch required for each Ethernet drop (1 per HVAC equipment) shall be housed in the NSP

## **2.6 SECONDARY (FIELD) LEVEL NETWORK**

### **A. RS-485 Networking (ASC and AASC Network)**

1. RS-485 networks shall be limited to daisy chaining BACnet, LonTalk, Modbus or approved equal Application Specific Controllers and BACnet, LonTalk, Modbus or approved equal Advanced Application Controllers.
2. RS-485 network shall extend from Building Controller to ASC and AAC controllers.

## **2.7 SYSTEMS INTEGRATION**

### **A. Fire Alarm System Integration**

1. Provide UL listed Fire Alarm System Interface.
2. General:
  - a. Provide a software driver that will provide a supervised link from the fire alarm system. Integration between the fire alarm system and the BMCS is intended to allow single seat operation for basic monitoring functions.



- b. Interface shall be UUKL Listed for smoke control.
  - c. Each fire alarm system smoke detector, heat detector, pull station, water flow switch, etc. shall be mapped to floor graphics. A detailed graphic for each floor in the building shall be provided.
  - d. Testing and software configuration shall be provided as required during startup and commissioning.
  - e. Any break in communications between the fire and BMCS systems shall be annunciated at each system. Upon restoration of communications, the interface shall automatically refresh fire alarm point status.
  - f. Provide any miscellaneous equipment required by the building automation system, such as trunk interfaces, modems, etc. to support the connection between the fire alarm systems and BMCS.
  - g. The interface shall include a driver that provides communications from the fire alarm/life safety system to the building automation system. Each point will be mapped into the BMCS so that they can be monitored and alarmed as though they were native to the BMCS. See the point schedule in Part 3 for a list of points that are to be integrated into the BMCS
3. Hardware
- a. All components required to provide integration shall be common to the BMCS or fire alarm system. No third-party hardware shall be allowed. No special hardware used only for integration purposes, or hardware not integral to the either the BMCS or fire alarm system shall be allowed.
  - b. All hardware used for interfacing the Automation System to the fire alarm system must be UL Listed for smoke control under UL 864 category UUKL.
4. Software
- a. The interface shall provide a supervised link from the fire alarm system to the BMCS. System administrators shall be able to configure the system to prevent operators from changing, reconfiguring, acknowledging or resetting the fire alarm system such that the fire alarm system remains the primary fire command station if desired.
  - b. The fire alarm system labels for each point shall be displayed as the alarm message text for each point in alarm. The interface shall report the following data from the fire alarm system for basic monitoring:
    - 1) Normal point status
    - 2) Alert for dirty for each point
    - 3) Status activity
    - 4) Activated under test
    - 5) Trouble (open/short)



- 6) Supervisory
    - 7) Alarm
  - c. Points that are mapped through the interface shall be able to be accessed by standard applications in the BMCS such as programming, alarm routing, graphics, and scheduling.
  - d. The following reports shall be provided at the BMCS workstation:
    - 1) Maintenance report
    - 2) History report of point and operator activity
    - 3) Test report, storing test results and status for each test detector
  - e. Operators shall be allowed to schedule reports to run unattended with their outputs directed to the operator screen, to a printer, and/or to a file.
  - f. Operator messages shall distinguish between the active state and trouble conditions on any point (alarm, supervisory, security, etc.).
5. For air handling unit graphics:
  - a. Provide a link to associated spaces, floor plans, and individual graphics
  - b. Provide the average of flow setpoints for all supply boxes served by that air handling unit. (Flow setpoint is an indication of flow vs. damper position indicating relative airflow capacity utilized by the flow control device, therefore providing indication of over/under pressurization of the ductwork system.)
  - c. Provide min and max box flow setpoints of all rooms served by each air handling unit to determine operating extremes in each ductwork system.
6. For exhaust fan graphics:
  - a. Provide a link to associated spaces, floor plans, and individual graphics.
  - b. Provide the average of flow setpoints for all exhaust boxes served by that exhaust fan. (Flow setpoint is an indication of flow vs. damper position indicating relative airflow capacity utilized by the flow control device, therefore providing indication of over/under pressurization of the ductwork system.)
  - c. Provide min and max box flow setpoints of all rooms served by each exhaust fan to determine operating extremes in each ductwork system



## 2.8 INTEGRATION BETWEEN SUB-SYSTEMS

- A. General: The BMCS is responsible for integration to all devices described within this section. The BMCS shall provide integration protocols of the type, quantity, redundancy, engineering as described in this section. Deviations are not acceptable. The contractor shall provide network wiring as described within this section.
- B. VFDs (Variable Frequency Drives)
1. Communication Medium: RS-485 Twisted Shielded Pair
  2. Required Engineering: VFD's shall be daisy-chained to an Ethernet based Building Controller.
  3. Communication Protocol: BACnet, LonTalk, Modbus or approved equal.
  4. Wiring Responsibilities: BMCS manufacturer shall provide and install communication wiring, in conduit, between each VFD and BMCS panel.
  5. Points Monitored via integration:
    - a. Drive Status, Alarm Status, Maintenance Required, Drive Speed, Frequency, Voltage, Current, Power, Temperature, Drive KWH, Run Time
    - b. Allow for 25 additional software points mapped to the BMCS.
  6. Hardwired Points:
    - a. Safety shutdown, Start/Stop, Speed Control Output, Common Fault, Fan Status, Bypass Mode
    - b. As indicated in the sequence of operation.
- C. Boiler System
1. Communication Medium: RS-485 Twisted Shielded Pair
  2. Required Engineering: Boiler controllers shall be daisy-chained to the boiler master controller which shall be connected to an Ethernet based building controller or communication interface panel.
  3. Communication Protocol: BACnet, LonTalk, Modbus or approved equal.
  4. Wiring Responsibilities: BMCS manufacturer shall provide and install communication wiring, in conduit, between each boiler controller and the boiler master panel, and from the boiler master 1 to the BMCS. Contractor shall mount and power communication interface panel (if required).
  5. Points Monitored via integration:
    - a. Allow for 20 software points for overall boiler system and 20 software points per individual boiler mapped to the BMCS.



6. Hardwired Points:

- a. Boiler enable, Status, Common alarm, Supply water setpoint, Supply hot water temperature, Return hot water temperature, Water Flow rate, BTU/Hr.
- b. As indicated in sequence of operation.

**2.9 DIRECT DIGITAL CONTROL PROCESSING UNITS**

- A. GENERAL – Direct Control processing units shall provide functional capabilities as detailed herein. Alternate methods to facilitate the functionality of the Direct Digital Control and Processing Units may be acceptable. Alternate methods must satisfy intent of this specification and deviations must be clearly indicated in Engineering submittal.
- B. Direct Digital Control Panels shall speak peer-to-peer directly on the Ethernet network without the use of interposing routers or gateways.
- C. Cat 6a cable shall homerun to each Building Controller on the Automation Layer such that communication between major HVAC equipment and the System Server(s) shall be direct without any single point of failure.
- D. The Direct Digital Control and Processing Units shall be Ethernet based BTL Listed Building Controllers (B-BC) with On-Board BBMD (BACnet, LonTalk, Modbus or approved equal) Broadcast Messaging Device) capability. All BC's shall be provided with IP addresses.
- E. A BACnet, LonTalk, Modbus or approved equal IP Building Controller (B-BC) with on board BBMD capability shall be provided for each major HVAC system including but not limited to AHU, ERU, H&V, DOAS, Chilled Water System, Condenser Water System, Heating Plant, Exhaust Fan Set, Pump Sets.
- F. Communications: Minimum speed 10/100 Mbps peer to peer.
- G. Control panels shall support as a minimum the following protocols on the Automation Level: BACnet I/P, Modbus TCP, SNMP, HTML or approved equal.
- H. Control panels shall include communication ports for the following Field Level protocols: BACnet MS/TP, Modbus RTU, LON or approved equal.
- I. Direct Digital Control and Processing Unit application programs shall be resident in the Direct Digital Control and Processing Unit at all times in Erasable Programmable Read Only Memory (EPROM) or in random access memory (RAM), IMB minimum and include a 100-hour minimum battery backup for data base. Database changes made at the OWS shall be downloaded from the OWS to any Direct Digital Control and Processing Units. Likewise, database changes made at the Direct Digital Control and Processing Unit shall be uploaded to the OWS. Once downloaded, a Direct Digital Control and Processing Unit shall not require further communication with the OWS except for database changes, OWS commands, and requests from the OWS for Direct Digital Control and Processing Unit detected changes of state. Panels using battery backed RAM for programming and database storage shall also have the capability to commit this information to EPROM / Flash ROM.



- J. The Direct Digital Control and Processing Unit shall be microprocessor based with a minimum word size of 32 bits. They shall also be multi-tasking, multi-user, real time digital control processors consisting of modular hardware, communication controllers, power supplies and input/output point modules. Each Direct Digital Control and Processing Unit shall have sufficient memory, a minimum of 16 megabytes, to support its own operating system and databases. The Direct Digital Control and Processing Unit shall include one or more central processors as required for application processing and for communication processing. The Direct Digital Control and Processing Unit shall have its database and program stored in its RAM, which shall include battery backup (minimum of 100 hours).
- K. Provide a master calendar/clock to be used by the system processor. The clock shall provide time to the second with a minimum resolution of 1 millisecond. All processors shall operate on the same clock frequency. Direct Digital Control and Processing Unit panels shall have their clocks synchronized to the BMCS server at least once per day.
- L. Enclosures shall be rigidly secured to a wall or floor, as appropriate, allowing sufficient ventilation space at the back, sides or top as required. All components shall be totally accessible through the front door without the need to remove adjacent components, wiring or piping. All wiring shall enter the cabinets from the bottom or side with bushings. No openings shall be allowed in the top of the cabinet unless sealed water tight. All Direct Digital Control and Processing Unit enclosures shall have cylinder locks all keyed alike.
- M. Direct Digital Control and Processing Units and all associated components shall be suitable for operation in environmental conditions between 32°F and 122°F and less than 93% relative humidity non-condensing. Where internal air circulation fans are required for reliable operation, they shall be installed.
- N. All electronics in the Direct Digital Control and Processing Units shall be constructed with modular based I/O modules or as specified below. The Direct Digital Control and Processing Units shall be capable of, as a minimum, the following I/O functions:
1. Point Modules: Multiple point modules using a maximum of 16-point multiples for binary inputs and outputs, analog inputs and outputs, and accumulator inputs shall be provided. These modules shall be able to be added to via expansion panels to provide a maximum of 500 direct connection points in a single Direct Digital Control and Processing Unit. The modules shall be mounted in a pre-wired chassis for convenient mounting. Modules may utilize DIN rail mounting.
  2. Binary Inputs (Digital Inputs): All binary inputs shall be optically isolated and shall detect switch contact position. Binary excitation power shall be provided by the Direct Digital Control and Processing Unit, separate and isolated from all other Direct Digital Control and Processing Unit power and from earth ground. With the removal of a binary input module all field wiring for that card shall be disconnected from all Direct Digital Control and Processing Unit circuitry including excitation power.
  3. Binary Outputs (Digital Outputs): Binary outputs shall operate at 24V dc. All output points shall be relay-isolated through interposing relays. Output points shall be selected by board jumpers or switches to be latched or pulsed. The Direct Digital Control and Processing Unit shall have space within the high voltage enclosure (Field Equipment Panel) for a minimum of 56 interposing relays (if required) driven by the binary outputs. Each relay shall provide a form C contact rated at a minimum of 10 amps at 120V ac. Provide an LED indicator on each interposing relay provided and/or output point for indication as to the state of the relay and/or output. Power for driving the relays shall be provided by the Direct Digital Control and Processing Unit and shall be isolated from earth ground. With the



removal of a binary output module all power to the relays associated with that card from the Direct Digital Control and Processing Unit shall be disconnected.

4. Analog Inputs: The Direct Digital Control and Processing Unit shall accommodate the following sensor inputs.

a. Sensor Type

- 1) 10K Thermistor – Type II Curve
- 2) 100K Thermistor – Type II Curve
- 3) 100 ohm platinum RTD                      20° to 100°F
- 4) 100 ohm platinum RTD                      -40° to 125°F
- 5) 100 ohm platinum RTD                      32° to 250°F
- 6) 1000 ohm platinum RTD                      20° to 100°F
- 7) 1000 ohm platinum RTD                      -40° to 125°F
- 8) 1000 ohm platinum RTD                      32° to 250°F
- 9) 1000 ohm nickel RTD
- 10) 0-200 ohm rheostat                      Assignable
- 11) Three-wire potentiometric                      Assignable
- 12) Relative humidity                      30 to 90%
- 13) Relative humidity                      0 to 100%
- 14) Duct Static pressure                      0 to 3 in. wc
- 15) Fluid Static pressure                      0 to 40 PSIG
- 16) 0-1 Volt dc linear floating                      Assignable
- 17) 0-5 Volt dc linear floating                      Assignable
- 18) 0-10 Volt dc linear floating                      Assignable
- 19) 4-20 mA dc linear floating                      Assignable



5. Each point shall be assignable to one of the above sensor types and able to be reassigned at any time.
6. The analog-to-digital conversion shall be accomplished with a minimum of 16-bit resolution, plus sign and overflow. The sample shall be integrated over a period of 100 milliseconds for noise rejection. The A/D converter shall not require on-board calibration. The analog board shall continuously scan all points connected to it and place the converted data into on-board RAM memory. This memory shall be directly accessed by the Direct Digital Control and Processing Unit application processor. The application processor shall never have to wait for analog-to-digital conversion in order to read an analog point. Signal conditioning and excitation shall be internal except for voltage and current inputs, which may be separate. All levels of analog excitation voltage shall be isolated from earth ground. With the removal of an analog input module all field wiring associated with that module shall be disconnected from all Direct Digital Control and Processing Unit circuiting including excitation power.
7. Analog Outputs: The Direct Digital Control and Processing Unit shall be capable of outputting a 0 to 10V dc analog signal and a 4 to 20 mA analog signal (10-bit resolution minimum). The voltage and current outputs shall be able to be scaled individually by software to any range within the maximum output range. The analog output signals and the pulse signals shall both be capable of driving transducers to result in a modulating 3 to 15 psi pneumatic signal. I/P, E/P, or pulse/p transducers shall be mounted in the field equipment panel. With the removal of an analog output module all field wiring associated with that module shall be disconnected from all Direct Digital Control and Processing Unit circuitry.
8. efPulse Accumulation: Pulses from power meters, turbine meters, or other pulse generating sensors shall be accumulated in the Direct Digital Control and Processing Unit. Accumulator input shall be capable of a 20Hz pulse rate. Up to 65,000 pulses shall be accumulated before rollover to 0. Provide debouncing circuitry that shall filter out any pulse shorter than two milliseconds. The ability to reset the accumulated data shall be provided by software. No additional hardware shall be required to use a binary input as a pulse accumulation input.

O. Support

1. The following minimum features shall be provided to facilitate support:
  - a. All active circuit components shall be mounted on plug-in circuit cards for ease of removal and replacement.
  - b. A mechanism to allow for disconnecting from the communications trunk. Additionally, the Direct Digital Control and Processing Unit shall easily be able to be connected to field test equipment.
  - c. Primary power, logic power and each level of excitation power "ON" indicator lights along with indicator lights which demonstrate that the Direct Digital Control and Processing Unit is receiving and sending transmissions both on the communications trunk, and internally.
  - d. An auxiliary 120V ac duplex power outlet shall be available in, or adjacent to the Direct Digital Control and Processing Unit to connect test equipment.



- e. A reset switch in the Direct Digital Control and Processing Unit to request both hardware and software restart and initialization from the OWS.
- f. An RS-232 port for the connection of a modem, printer or operator's terminal.
- g. A "Low Battery" status indication that will annunciate and alarm at the OWS when the battery requires replacement.

**P. Wiring Features**

- 1. Incorporate the following design features to ensure failsafe operation of the system:
  - a. The multiplexing communications interface shall be electrically isolated from the communications trunk so that component failure within the Direct Digital Control and Processing Unit will not affect the data traffic on the trunk for other Direct Digital Control and Processing Units.
  - b. Binary input field electrical circuits shall be electrically isolated on individual circuit cards to minimize damage to Direct Digital Control and Processing Units.
  - c. All field wiring to Direct Digital Control and Processing Units shall be terminated at barrier type screwdriver terminal strips not directly to a controller I/O module. Terminal strips shall not be mounted either on the individual point cards or shall be mounted external to the cards and the signals internally routed to the point cards. Provide two screw connectors for each binary input, accumulator input, and analog output point. Four screw connectors shall be provided for each analog input point. Interposing relays where required shall have a terminal for normally open, for normally closed, and for common. Removable terminal strips built in to the Direct Digital Control and Processing Unit shall be an acceptable alternative to separate terminal strips.

**Q. Power**

- 1. The Direct Digital Control and Processing Unit, in normal operation, shall require 120V ac and dissipate no more than 200 watts. A power-on indicator, power switch, power line filter, and power fuse shall be provided. Surge protection for the power lines and the communication lines shall be provided.
- 2. The contractor shall provide two, 120 VAC 20 amp circuit breakers for BMCS power at each power panel. Additional circuit breakers beyond the above stated quantity, which may be required, shall be provided by the contractor.
- 3. Contractor to coordinate final location of each Direct Digital Control and Processing Unit panel within the mechanical room spaces.



R. Battery Back-up

1. All Direct Digital Control and Processing Unit memory and the Direct Digital Control and Processing Unit calendar clock shall be battery backed for a period of at least seventy-two hours. The batteries shall be continuously trickle charged when normal power is available. Batteries shall be Alkaline or Lithium and provide indication of the current level of readiness to the BMCS.
2. For Direct Digital Control and Processing Units controlling critical equipment where the controller must be insulated from momentary power losses (when the system is between normal power going off and awaiting emergency power, and vice versa, provide an uninterruptible power supply for each Direct Digital Control and Processing Units, OWS and ROWS. UPS shall allow for full and complete normal operation of the BMCS for a total of one half hour before the system performs a controlled shutdown. Whenever the Direct Digital Control and Processing Unit is switched to battery power it shall transmit a message to the OWS when polled (indicating that power failure has occurred).

**2.10 APPLICATION SPECIFIC CONTROLLERS**

- A. The control program shall reside in the application specific controller providing control when host computer communication or Direct Digital Control and Processing Units panel communication is not possible. The application program shall be maintained at the application specific controller in ROM, PROM, EPROM OR EEPROM. The default database, i.e., setpoints and configuration information, shall be stored in Electronically Erasable Programmable Read Only Memory (EEPROM).
- B. Application specific controllers requiring the application or database to be downloaded from a host shall not be acceptable. The zone controller must run the control application using the default setpoints and configuration after a power failure with the host disabled.
- C. The controller address shall be set by a hand-held, digital service tool or dip switches. All remaining database parameters shall be set by service tool or host computer.
- D. Each communication trunk shall support up to 96 terminal unit controllers. Each controller shall be assigned an individual address as designated by the contractor. The address shall be set into EEPROM using the service tool.
- E. The network trunks shall be as required by the acceptable manufacturer's system requirements. The network may consist of coaxial cable (Belden 9369, 9268, 9228, 82269, and 89269, GE, Belkin or approved equal), twisted pair cable with 100% foil shield of the gauge recommended by the manufacturer (Belden 1154A and 1155A, GE, Belkin or approved equal) or optical fiber (62.5 microns, duplex). All cables used in plenums shall have a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 ft. or less.
- F. Each controller shall have the appropriate quantity and type of inputs and outputs to control and monitor the equipment served. At minimum, provide inputs for air flow sensor, supply air temperature (each TUC), input for thermostat, input for CO2 sensor (where required) and outputs for primary air damper, fan start/stop and speed control (for fan powered boxes ECM motor), zone humidifiers (if applicable), lighting control, and electric heat control (duct mounted reheat and/or baseboard radiation). Outputs shall be electrically isolated from the inputs and communications line.



- G. The controller shall be an electrical class-II device constructed from UL tested flame and smoke retardant materials to allow mounting in the return air plenum. The controller shall be listed UL-916. The controller shall be surface mounted within an electrical panel, or the controller shall be mounted to a 4 x 4 Junction box and completely enclosed in a dust-proof, flame and smoke retardant housing.
- H. All electrical connections shall be made to a combination base and terminal strip assembly. To ensure long-term reliability, all electrical connections shall be screw type.
- I. Provide isolation transformers to protect and provide surge-free power to the controller. Transformers may be centralized for several controllers or provided individually for each controller.
- J. Provide coordination with the terminal device manufacturer and contractor for the controllability of the minimum and maximum flows, and sound criteria with required CFMs. Controllers shall be sent to the air terminal manufacturer for factory mounting.
- K. Provide coordination with the Commissioner for the final layout of all MERs and equipment rooms where Direct Digital Control and Processing Unit panels are located.

#### **2.11 FIELD EQUIPMENT PANEL**

- A. Provide field equipment panels to interface the Direct Digital Control and Processing Unit panels with pneumatic control devices. The panels shall house and interface relays and other miscellaneous control components.
- B. Connect the panel to its associated Direct Digital Control and Processing Unit. Panel shall contain barrier type terminal strips mounted for input and output wiring terminations.
- C. Identify all equipment internal to panel or face mounted with nameplates to match approved shop drawings.
- D. Field equipment panels shall be the same NEMA classification as all other panels located in the same environment, master key locked, hinged gasketed front door cabinet, construction to match Direct Digital Control and Processing Unit enclosures. Take necessary precautions to protect equipment as described in "Distributed Processing Units".
- E. If panel is located out of doors, its enclosure shall be NEMA 4. Provide auxiliary heating and/or cooling for components as required to keep the panel environment within the enclosed equipment's specifications.

#### **2.12 SENSORS AND CONTROL DEVICES**

- A. General
  - 1. Provide sensors and control devices as indicated on mechanical plans, control flow diagrams and as required to meet specified performance. Where performance specifications exceed capabilities of hardware specified, performance governs. The installation of such devices shall be the responsibility of this contractor.



2. Where high accuracy is required equip analog sensors with industry standard 4 to 20 mA or 0-10Vdc transmitters with built-in circuit protection against reverse polarity and supply voltage transients. The transmitters to be matched to the sensing element and compatible with the Direct Digital Control and Processing Unit.
3. All sensor/transmitters assemblies shall be factory calibrated.
4. All sensor wiring, analog or binary, input or output, shall be capable of sharing single conduit runs without affecting signal performance.
5. The sensor range and type to be suitable to the application.
6. Minimum contact rating of relays and switches shall be 4 amp 120 volts resistive.
7. Devices UL listed for electrical safety where applicable.
8. All components of sensors exposed to process shall be rated to withstand 150 percent of maximum process temperature and pressure.

**B. Thermowells**

1. Provide stainless steel thermowells for each immersion type temperature sensor and switch. Thermowells shall have extension for pipe insulation and threaded connection to pipe. Threaded connection shall be a minimum of 1/2 in. NPT. Maximum insertion length shall be 6" or 3/4 the pipe diameter whichever is smaller.

**C. Temperature Sensors**

1. Temperature sensor assemblies shall consist of a 100 or 1,000 OHM platinum RTD sensor and a solid state, protected in a housing suitable for the environment in which it is installed. Provide 2-wire, 4-20 mA transmitters where called for in the contract documents. Approved sensor - contractor's standard temperature sensor or Minco AS2 or AS3 series, Ebtron, Honeywell or approved equal.
2. Sensors for mixed air and coil discharge applications and for fan discharge applications in systems over 50,000 CFM averaging type sensors shall be used. Probe length shall be at least one linear foot per four square feet of duct area or equal to duct width where installed, whichever is longer. Approved sensor - contractor's standard temperature sensor or Minco TT809 series, Ebtron, Honeywell or approved equal.
3. Sensors for preheat coil applications shall be provided in the same quantity as the number of coil sections - 1:1. (One sensor per coil in a bank of coils.)
4. Outside air sensors shall be mounted on a northern exposure and mounted within a ventilated enclosure. Indicate exact location in shop drawings. Approved sensor - contractor's standard temperature sensor or Minco TT809PW4.001EN2, Ebtron, Honeywell or approved equal.



5. Terminal unit space temperature sensors may be thermistor type, minimum 10K with and accuracy of +/- .5 deg. F and a stability of .25 deg F over a minimum of five years. Approved sensor - contractor's standard temperature sensor or Minco TT859PW1H1, Automated Logics, Honeywell or approved equal.
- D. Humidity Sensors
1. Humidity, outside air and combo temperature/humidity sensor assemblies shall consist of a transmitter protected in a housing suitable for the environment where it is installed. Manufacturer as Minco, Ebtron, Honeywell or approved equal.
  2. The sensor accuracy shall not exceed  $\pm 2.0\%$  RH. Sensor span shall be 40 to 90% RH.
- E. Carbon Dioxide Sensors
1. Carbon dioxide sensors shall feature an analog output, utilize automated calibration, and non-dispersive infrared technology.
  2. Sensors shall operate with 18 to 30 VAC or 18-2 VDC, have a range of 0 to 2000 ppm, with an accuracy of  $\pm 100$  ppm @ 72 degrees F.
  3. Output shall be 0 to 10 VDC (1,000 Ohm impedance)
  4. Approved manufacturer: Telaire Model 5001 (Wall mounting) or 8041 (Duct Mounting), Ebtron, Honeywell or approved equal.
- F. BTU Energy Measuring Station
1. The entire BTU Energy Measuring Station shall be built and calibrated by a single manufacturer, and shall consist of a flow meter, two temperature sensors, a BTU meter, temperature thermowells, and all required mechanical installation hardware. A certificate of NIST\* traceable calibration shall be provided with each system.
  2. The BTU meter shall provide the following points both at the integral LCD and as outputs to the BMCS: Energy Total, Energy Rate, Flow Rate, Supply Temperature and Return Temperature. Output signals shall be either network interface (protocol conforming to BACnet MS/TP or BACnet/IP) and/or via individual analog and pulse outputs. Each BTU meter shall be factory programmed for its specific application, and shall be re-programmable using the front panel keypad (no special interface device or computer required).
  3. Temperature sensors shall be loop-powered current based (mA) sensors and shall be bath-calibrated and matched (NIST\* traceable) for the specific temperature range for each application. The calculated differential temperature used in the energy calculation shall be accurate to within  $+0.15^{\circ}\text{F}$  (including the error from individual temperature sensors, sensor matching, input offsets, and calculations).



4. The flow meter shall be Clamp-on Transit Time Ultrasonic Flow Meter, complete with matched transducers, self-aligning installation hardware and coaxial transducer cables. The flow meter shall be installed without making any openings in the pipe wall and shall utilize non-wetted ultrasonic transducers that may be located up to 300 ft from the meter. Ultrasonic transducers provided must be optimized for the specific pipe & process conditions for each application and the transducer frequency shall be automatically matched to the resonant frequency of the pipe at start-up. An integral auto-zero function shall be provided for zero precision and high accuracy, even at very low flow velocities. The flow meter shall be capable of measuring bi-directional flow. Accuracy shall be within  $\pm 1\%$  of rate from 1 to 40 ft/sec and  $\pm 0.01$  ft/sec for velocities below 1 ft/sec. Overall turndown shall exceed 400:1 installed either in the supply or return pipe of the system to be measured.
  - a. Electromagnetic and Turbine type insertion meters shall be considered. Turbine type shall not be acceptable for use in open loop condenser water applications.
  - b. The Contractor shall coordinate the exact locations of each meter including straight pipe lengths needed for proper installation with the Contractor. The Contractor is responsible for the piping required to accommodate the meters properly.
5. Manufacturers include: Onicon, Flexim, Honeywell or approved equal.

G. Air Flow Measurement Station (Fan Inlet)

1. Each thermal dispersion fan inlet sensor shall be designed specifically to be mounted directly in the inlet bell of centrifugal fans. The sensor probes shall utilize two "bead-in-glass" thermistors to determine the airflow rate and temperature at each sensing location. Accuracy shall be plus or minus 2 percent of reading. Provide model GTx116 transmitter. Each transmitter shall produce a linear, temperature compensated, output corresponding to the required velocity pressure measurement. Provide BACnet MSTP port for connection to BMCS.
2. Provide Ebtron Gold Series, GE, Honeywell or approved equal.

H. Air Flow Measurement Station (Duct Mounted)

1. Each insertion station shall contain an array of sensor probes, each containing one bead in glass hermetically sealed thermistor. The sensing elements shall be distributed across the duct cross section in a quantity to provide accurate readings. Station construction shall be suitable for operation at airflow from 0 up to 5,000 fpm over a temperature range of -20 to 160 degrees F, and accuracy shall be plus or minus 2 percent of reading. Provide model GTx116, Ebtron, Honeywell or approved equal transmitter. Each transmitter shall produce a linear, temperature compensated, output corresponding to the required velocity pressure measurement. Provide BACnet MST/IP port for connection to BMCS.
2. Provide Ebtron Gold Series, GE, Honeywell or approved equal

I. Water Flow Proving Switch

1. Flow switch shall have the following features;
  - a. Stainless steel bellows, NEMA 5 (IP54) enclosure



- b. Pipe connection – 1” MNPT for pipe sizes 1” to 8”
- 2. Manufacturers
  - a. Caleffi 626600A, Ebtron, Honeywell or approved equal
- J. High Temperature Limit Switch
  - 1. High temperature switch shall be SPST open high, manually reset, with an operating range of 100 to 240 deg. F. High limit switch shall use a liquid filled capillary and be well mounted.
  - 2. Manufacturers: Johnson Controls model A19ADB-1C, Ebtron, Honeywell or approved equal.
- K. Differential Pressure Transmitter Assembly - Water
  - 1. Assembly shall consist of a differential pressure sensor and an electronic 2-wire, 4-20 mA transmitter assembly enclosed in a gasketed, dust and watertight case. All body cavities open to the process fluid shall be provided with drain ports at the cavity bottom and vent ports at the top of the cavity. Both drain and vent ports shall be minimum 1/4" NPT.
  - 2. The transmitter shall be capable of sustaining differential pressures in either direction, up to the body rating without damage to the instrument, loss of accuracy, or zero shift. Provide a sensor with a minimum accuracy of  $\pm 1\%$ , a linearity of  $\pm 0.1\%$ , a repeatability of  $\pm 0.1\%$ , and a hysteresis of  $\pm 0.1\%$ .
  - 3. The transmitter shall be fully compensated for both process and ambient temperature variations. The transmitter shall be furnished complete with input gauges and factory mounted 3-valve manifold.
  - 4. Manufacturers:
    - a. Siemens
    - b. Rosemont
    - c. Johnson Controls
    - d. Or Approved equal
- L. Differential Pressure Switch - Liquid
  - 1. Shall be Penn Model P74, Ebtron, Honeywell or approved equal.
- M. Differential Pressure Switch - Air
  - 1. Shall be diaphragm operated and actuate a SPDT snap-acting switch. Operating point shall be adjustable. Range shall suit application.
  - 2. High and low sensing ports shall be 1/8" NPT or 1/4" compression connected to angle type tips designed to sense pressure.



3. Switches used for fan shutdown shall be manual reset type.

4. Manufacturers:

- a. Dwyer
- b. Johnson Controls
- c. GE
- d. Or Approved equal

**N. Differential Pressure Switch - Filters - Non-Indicating**

1. Shall be diaphragm operated to actuate SPDT snap-acting switch. Operating point shall be adjustable. Setpoint shall be indicated on visual scale. Range shall suit application.
2. High and low sensing ports shall be 1/8" NPT connected to angle type tips designed to sense pressure.
3. Manufacturers: Dwyer Series 1638, Cleveland AFS series, GE, Honeywell or approved equal.

**O. Differential Pressure Switch - Filters – Indicating**

1. The differential pressure sensor shall be configured for air pressure ranges as low as 0.1 in. W.C. full scale, with Pascal ranges as low as 25 Pa full scale.
2. Static standard accuracy is 1.0% full scale in normal ambient temperature environments. The units are temperature compensated to within 0.02%FS/°F (0.036%FS/°C) for zero and span.
3. Utilize an all stainless steel micro-tig welded sensor. The tensioned stainless steel diaphragm and insulated stainless steel electrode, shall position under pressure to form a variable capacitor.
4. Manufacturer: Setra, Siemens, Johnson Controls or equivalent approved equal.

**P. Level Switch**

1. Float type level switch with SPDT snap acting contacts. Electronics shall be housed in a watertight enclosure.
2. Manufacturers:
  - a. McDonnell & Miller
  - b. Delta.
  - c. Honeywell
  - d. Or Approved equal.



**Q. Damper End Switch**

1. Switch shall be actuated by the damper blade reaching the position specified in the sequences of operation required for the next step of control to be completed.
2. Provide encapsulated mercury type switch shall be model TS-470 or non-mercury TS-475 as manufactured by Kele, Ebtron, Belimo or approved equal.

**R. Low Limit Thermostat**

1. Shall have a 20-foot flexible vapor charged element. When temperature sensed by any 12 in. segment of the element falls below setpoint (usually 40°F), thermostat shall operate DPDT manual reset contacts.

**S. Leak Detector Switch**

1. Probe type liquid detector. Adjustable detection level. Relay outputs allow the unit to simultaneously alarm the BMCS while shutting down the system.
2. Manufacturers: Liebert LT410, Kele WD-1B, Honeywell or approved equal.

**2.13 AUTOMATIC DAMPERS**

- A. Provide and install automatic dampers.
- B. Install damper actuators of sufficient quantity and size to limit leakage to specified rate. Damper assemblies consisting of multiple damper sections to be provided with at least one damper actuator per section or be connected with an approved jack shafting arrangement.
- C. Include actuator torque capacity in submittals.
- D. Dampers used in smoke applications shall be UL rated smoke dampers. Where the return fan of an Air Handling Unit is used for smoke removal, the return air damper shall be a smoke damper. In these cases, the return air damper shall be normally closed and held open by the control signal. In the event of a fire alarm that shuts down the air handling unit, the fire alarm system will interrupt the power to the actuator, and the damper will close. Similarly, the spill air damper will be normally open, held closed by the control signal. In the event of a fire alarm that shuts down the air handling unit, the fire alarm system will interrupt the power to the actuator, and the damper will open. During all other times, the damper will be open, closed or modulating based upon the control signal to the damper. During normal shutdown, the return air damper will open and the spill air damper will close unless otherwise directed in the sequences of operation.
- E. Coordinate with Specification 23 33 13..

**2.14 AUTOMATIC VALVES**

- A. Automatic control valves shall be globe type with modulating plug, throttling guides, replaceable seats and discs, and stainless steel stems or characterized flow control valves.



- B. Valves 2 in. and smaller may be characterized ball valves or globe type. Ball valves shall have nickel plated forged brass bodies, stainless steel stems and balls with fiberglass reinforced Teflon PTFE seals. Globe valves shall have bronze bodies with screwed ends. Valves 2½ in. and larger shall be globe type with iron bodies with flanged ends.
- C. Valve body rating shall be equal or greater than the piping in which it is installed and the valve shall be rated for operation against the maximum system differential pressure. Rangeability shall be at least 40 to 1 or as required to provide proper control. Leakage shall not exceed 0.01 % of rated CV for single seated valves and 0.5% of rated CV for double-seated valves.
- D. The valves shall be quiet in operation and fail safe in either normally open or normally closed position in the event of a power failure. Valves capable of operating at varying rates of speed to correspond to the exact dictates of the controllers and variable load requirements, and shall be capable of operating in sequence when required by the sequence of operation. Submit valve close off pressure ratings.
- E. Valve operators shall be of the electric, spring return type sized to insure tight seating against maximum differential pressure. Provide mechanical direct reading movement indicators on all valves 2½ in. or larger. Provide positive positioning relays on valves operated in sequence and all valves 2½ in. or larger.
- F. Characteristics
1. Chilled Water Service: Equal percentage flow characteristics, single seated type. Provide double-seated type for high close-off pressure applications.
  2. Hot Water Service: Equal percentage, single seated. For water temperature 250°F or greater provided stainless steel plug and seat.
  3. Steam Service: Linear flow characteristics, single seated. For steam 50 psig or greater, provide stainless steel plug and seat.
  4. Bypass Service: Linear flow characteristics. Single or double seated.
- G. Valve Action
1. Cooling valves normally closed.
  2. Preheat valves normally open (one per coil section).
  3. Reheat valves normally closed.
  4. Or as noted.
- H. Size valves to meet the coil loads as specified and as follows:
1. All valves shall be sized based upon data from approved equipment submittals.
  2. 2-Position Valves: Line size unless noted.



3. Water Service: Maximum pressure drop shall be equal to the pressure drop of the associated coil or exchanger, or 5 psi whichever is greater.
4. Steam Service: Minimum pressure drop equal to 80 percent of steam inlet gauge pressure but not greater than 50 percent of absolute pressure.
5. Relief and Bypass Valves: Sized according to pressure available.
6. Chilled Water Service: Where load exceeds capacity of 4 in. control valve provide two valves operating in sequence the larger valve shall have a coefficient of flow (CV) that is between 2 and 3 times larger than the smaller valve.
7. Steam and Hot Water Service: Where load exceeds capacity of 2½ in. valve, provide two valves. The larger valve shall have a coefficient of flow that is between 2 and 3 times larger than the smaller valve.

## **2.15 BUTTERFLY VALVES**

- A. Butterfly valves permitted for use for two-position operation on low temperature water applications only.
- B. All butterfly valves shall be of the full lug body style with lugs drilled and tapped and have drip tight shutoff capabilities in either direction up to and including maximum system working pressure. Butterfly valves shall be capable of closing tight after long periods of inactivity. All valve bodies 24 inch and above to be dual flanged. Flanges to be drilled through to ANSI Standards.
- C. All valves shall be suitable for use with ANSI Standards flanges. Bodies shall be semi-steel or cast iron.
- D. Valves shall provide tight shutoff up to the full valve rating on dead end or isolation service without the use of downstream flanges. Submit valve close off pressure ratings.
- E. All valves shall be furnished with self-lubricated bronze bearings. Shafts seals shall be provided to prevent leakage and to protect bearings from internal or external corrosion.
- F. Seats shall be of the reinforced resilient type (or retained seat on high performance valves) and shall also act as a body liner to prevent flow from contacting the body casting. Resilient seats shall have flange sealing lips to provide a positive seal without use of flange gaskets.
- G. Seats shall be suitable for use with HVAC water to 250°F. Shafts shall be one piece and shall be of 416 stainless. Shafts shall be finish ground and polished to minimize bearing and shafts seal wear. Shafts of 8 inch and larger valves shall have a non-adjustable thrust collar.
- H. Discs shall be semi-steel with welded nickel edge. The disc-to-shaft connections shall be type 316 stainless steel. Pins, shaft and disc of all valves shall be individually machined and completely interchangeable.
- I. Provide valves with factory installed actuators of the electric or electro hydraulic type and sized for tight shutoff at maximum system differential pressure. Actuators for modulating service shall be equipped with integral position potentiometer. Provide actuators with an integral hand wheel or local manual controls for manual operation. Each actuator shall be equipped with adjustable limit switches. Input voltage shall be 24, 120, or 480 VAC, 60 HZ.



- J. Valves shall be line size unless otherwise noted on drawings.
- K. Manufacturers: Bray, Jamesbury, Posiseal, Belimo, Keystone, or approved equal.

## **2.16 SERVICE KIT**

- A. Provide three service kits for use by City of New York's personnel in testing and making minor service adjustments to the system. Include as a minimum:
  - 1. All specialized nonstandard tools and adapters and fittings required for operating, maintaining, testing and adjustment of the system.
  - 2. Lubricant required for automatic valves and automatic dampers, one year supply.

## **2.17 SOFTWARE**

- A. General
  - 1. Fully implement, optimize, and commission all software described under this paragraph and required for a complete operable system.
  - 2. Although "Program" implies software, hardware solutions may be acceptable after review and approval of Commissioner. Such differences are to be considered deviations and presented as such.
  - 3. Software programs are described as to general intent. It is recognized that contractors' software differ; however, the programs that are provided shall incorporate the features described.
  - 4. Each point shall be identified in software with a unique point name. Point names shall be logically and consistently coded to allow identification of the point location (e.g., Building, MER), associated HVAC system (e.g., AHS-1, Chiller-2), and point function (e.g., supply temp, freezestat) as a minimum.
  - 5. Original copies of all software tools and programs utilized to program system shall be turned over to the commissioner at the completion of the project. This includes but is not limited to; operating system, GUI development software, controller programming software, network management and diagnostic tools.
  - 6. Provide City of New York with all software license agreements.
  - 7. Provide City of New York with complete system backup, including all user workstations, controllers, databases, etc. on CD format.
- B. Executive Software
  - 1. The executive software shall include all programs needed to manage the scheduling of both system and application programs. It shall also include all programs needed for use of the systems peripheral devices and communications networks. Parts of this software may be restricted from user modification to insure system integrity. However, the following user access to the executive software shall be provided.



- a. Ability to switch failing output devices to another device without loss of data or otherwise handle device failures (e.g., jammed printers).
  - b. Ability to modify the priorities and scheduling of application programs.
  - c. Ability to add or delete peripheral devices.
2. Provide diagnostic programs to report and display Direct Digital Control and Processing Unit system failures at all Operator's console both on LCD display and printer. Provide on-line error detection and messages.
  3. Peripheral Equipment Selection:
    - a. Provide peripheral equipment selection control to apportion data to peripheral console as required (e.g., alarms to alarm printer).
    - b. Apportionment of Data and Control Functions shall be a programmable function by a high level operator at any console. Initialization of the apportionment of data shall be according to the description of the Functional Requirements stated under each Console Description. Contractor shall provide all software and programming time required to initialize the system. Submit initial apportionment for all monitored and control functions for review prior to final programming.
    - c. The graphics display shall be logically divided to allow the simultaneous occurrence of operator interaction and alarm indication with no interference to each other's screen display.
  4. System Access Control: Provide a minimum of sixteen levels of access using selectable passwords to the system software. Each higher level will increase the allowed interaction by the user. Each password must be entered by the operator to access a particular level of system operation. The password shall not be displayed or printed. Each password shall be unique for each operator.
  5. The system shall observe the following command priorities (from highest to lowest):
    - a. Smoke Control and Life Safety
    - b. Manual Operator Command
    - c. Energy Management
    - d. Automatic Control

**C. Operator Interface Program**

1. Provide a high-level language as the operator interface with the system for defining and selecting points, parameters, report generation, graphics, and all functions associated with day-to-day operation of the system.
2. Provide software to notify the operator (via a smartphone, tablet, mobile device, etc.) of the occurrence of an alarm condition. All alarm messages shall be displayed on the monitor, on the local printer, and on the remote printer in simple English-language format. System shall print and sound an audible alarm



at each occurrence. Operator acknowledgment shall silence the audible alarm. System shall print upon return to normal. The contractor shall set all alarm thresholds.

3. Report Generation Software shall be provided to present system information in an organized manner.
  - a. System Point Log - A log for each system, which shall include all points required for operation and monitoring of the system. Do not include points which are used in intermediate calculations and program logic or points used for system tuning and set up.
  - b. Display for each point: Point Name, Point Description, Current Value, Engineering Units, Alarm Status and Command Priority.
  - c. Application Program Logs - Log for each program shall include current values of all points and parameters used in application program.
  - d. Summary Logs - Logs, which summarize system status. Include as minimum:
    - 1) Alarm Summary
    - 2) Run Time Totalization Summary
    - 3) Disabled Point Summary
4. Provide fully implemented interactive graphics with latest available process data fully integrated with the display. Point values shall be dynamically updated at least every 20 seconds or based on change of value settings for the system.
5. Use different colors for the various system components to facilitate rapid recognition and ease of interaction. Colors shall be uniform on all displays, such as all master alarms red blinking with reverse field.
6. Graphics generation and editing shall be via a high level interactive programming language. The graphics program shall be provided with a library of standard symbols with the capability for user to add custom symbols.
  - a. Provide graphics for but not limited to the following:
    - 1) Graphics shall be arranged such that the opening screen is a representation of the building facade and shall contain depict the outside air temperature, humidity and weather data from NOAA and any other point specifically noted in the sequences of operation.
    - 2) Clicking on a particular floor will display that floor plan with space temperatures displaying actual space temperatures at the sensor location. If the space sensor is picked, the individual VAV box or associated control loop shall display. The floor plan shall also display the mechanical equipment rooms.
    - 3) Clicking on a mechanical room will display the equipment in the room. If the room contains only one fan for example, the graphic for that fan shall be displayed. If the room



contains several fans, the different fans will display, and picking a particular fan will cause the system to display the flow diagram for that system, with all associated points displaying their data in real time. Provide a pick point on the graphic, that when selected, will bring up the approved sequence of operation for the system. Provide embedded data sheets (PDF Files) for each device so that when the device is selected, its associated data sheet will be displayed.

- 4) Floor plans showing status of associated points within area including but not limited to: smoke detectors, HVAC equipment, associated lighting contactors. Indicate locations of equipment within area such as Direct Digital Control and Processing Units, FEPs, MERs, space temperature sensors, lighting control panels, etc. Where a floor has several zones, program the graphics to display a color indicating the space temperature with respect to drift from setpoint as follows:

<u>Space Temperature</u>	<u>Zone color</u>
4 or more degrees below setpoint	Dk. Blue
2 to 3.9 degrees below setpoint	Lt. Blue
At setpoint plus or minus 1.9 degrees	Green
2 to 3.9 degrees above setpoint	Orange
4 or more degrees above setpoint	Red

- 5) Separate Air and Water Systems Riser Diagrams showing all systems in Block Diagram Form. System status (on, off, alarm) shall be indicated. Risers shall include common sensing points such as outside air and supply and return temperatures in main piping systems.
- 7. Provide software to output a user programmed message in response to an alarm or change of value of any system point. Message length shall be at minimum 4 lines of 80 characters each. All messages shall be submitted for approval, programmed by the contractor during start up, and demonstrated during acceptance.

**D. Application Software**

- 1. System shall contain all of the following application software whether implemented in the present scope of work or required in the future.
- 2. Time of Day Scheduling:
  - a. A comprehensive program shall be provided to automatically start and stop equipment based on the time of day and day of week, including holidays. The scheduled time-of-day program shall operate in conjunction with and shall be coordinated with optimized Start/Stop, program.
  - b. It shall be possible to individually command a point or group of points. For points assigned to one group it shall be possible to assign variable time delays between each successive start or stop command within that group. The system shall have the capacity to accommodate a minimum of 500 uniquely defined schedules. Each load group shall be capable of accommodating a minimum of 250 loads.



- c. The operator shall be able to define the following information:
  - 1) Time, day, dates.
  - 2) Commands such as on, off, auto, etc.
  - 3) Load or loads assigned to groups.
  - 4) Time delays between successive commands.
  - 5) There shall be provisions for manual overriding of each schedule by an appropriate operator.
- d. The following reports shall be provided:
  - 1) Report of any and all defined time schedules.
  - 2) Loads assigned to each time schedule.
- 3. Start/Stop Time Optimization (SSTO):
  - a. The automation system shall include a software program to perform optimized start-up and shutdown of selected equipment and for all system with a design air capacity greater than 10,000 CFM. The SSTO program shall start HVAC equipment at the latest possible time that will allow the equipment to achieve the desired zone conditions by occupancy time. The SSTO program shall also shutdown HVAC equipment at the earliest possible time before the end of the occupancy period, and still maintain desired comfort conditions.
  - b. The SSTO program shall operate in both the heating and cooling seasons. It shall be possible to apply the SSTO program to all individual systems.
  - c. The SSTO program shall operate on outside weather conditions as well as inside zone conditions, and empirical factors. The empirical factors shall relate to the dynamic responsiveness of particular zones such as heat retention and transfer coefficients. The program shall be fine-tuned during the guarantee period using empirical data compiled during operation of the building.
  - d. The program shall automatically adjust itself utilizing adaptive control techniques.
  - e. The system operator shall be able to, for each system under control of the SSTO program, establish and modify the following parameters:
    - 1) Occupancy period
    - 2) Desired occupancy temperature
    - 3) Heating/cooling transfer coefficients
    - 4) Heating/cooling retention coefficients



- 5) Primary equipment lag time
  - f. A report shall be provided detailing SSTO parameters such as zone coefficients, zone occupancy time and temperature, activated/inactivated zones, etc.
4. Electrical Demand Limiting:
- a. The BMCS shall include a software program to perform electrical demand limiting (EDL). The EDL program shall monitor the rate of electrical power consumption and forecast the total demand during each demand interval using a sliding window approach.
  - b. The program shall automatically shed and restore loads to prevent the electrical demand from exceeding and operator set level.
  - c. Kilowatt rating of each load stored in computer memory to ensure proper number of loads being shed when excessive electrical demand is predicted. For scheduling purposes, each load assigned to one of three priority groups:
    - 1) Priority Group 1 and 2 - Automatically shed as required.
    - 2) Priority Group 3 - Issue operator advisory to manually shed particular load by operator action at console.
  - d. When load shed condition exists, program begins searching for loads in Groups 1 and continues through Group 3 until necessary number of kilowatts have been shed. Loads within each group shall be shed on a round robin or fixed basis. Load restoration procedure is opposite of load shedding procedure.
  - e. Each load shall be programmed with maximum off time, minimum on time and minimum off time.
  - f. The operator shall be able to define the following information:
    - 1) Load KW and priority
    - 2) Maximum demand setpoint
  - g. The following information shall be available in report form:
    - 1) Load Data
    - 2) Maximum Demand for a given period (day, week, month, etc.)
    - 3) Current demand and loads shed
  - h. When maximum target is exceeded alarm shall sound, current demand in KW displayed and printed out with time of occurrence on alarm printer.



- i. Degraded Mode: Loss of all or part of data trunk cable shall not cause the shed loads to restart and the electrical load to exceed setpoint. Direct Digital Control and Processing Units shall be capable of cycling connected loads in a stand-alone mode as to eliminate or reduce potential increases in maximum demand level.
5. Automatic Restart:
    - a. During a power outage the Direct Digital Control and Processing Unit operating programs and database shall be protected against loss by memory battery backup. (If the length of the power outage exceeds the battery backup capacity, the programs and database shall be automatically reloaded from the disk storage upon power restoration.) After power has been restored, the system points shall either be returned to the state they would be in if there were no power outage or remain off as defined by equipment and operational requirements. Points to be restarted shall start over a programmed time schedule to affect soft start.
  6. On/Off normal alarm:
    - a. If any device starts or stops as a result of a local event, overriding the last command of the BMCS, an alarm shall be sounded at the BMCS.
  7. Automatic False Alarm Lockout:
    - a. When systems are off, certain analog variables may drift past programmed alarm limits. Inhibit analog variable limit alarms until after system is restarted and stabilized.
  8. Historical Trending:
    - a. Any system point either real or calculated shall be assignable to the historical trending program. All changes in point value shall be recorded for points assigned. The trend interval shall be user selectable. All trend information shall be recorded in nonvolatile memory. Provide system capacity to trend a total of 300 points every 30 seconds without any notable system degradation. Field panels shall be able to store up to 2,500 trend samples per point and can be selected for intervals of 1 minute to 7 days.
  9. Psychrometric Calculations:
    - a. The system shall be equipped with a Psychrometric calculation module, which will calculate any point on the Psychrometric chart when supplied with two other points of data.
    - b. The calculation shall operate in the dynamic mode, allowing system input points to be used as calculation inputs and the result used in control loops where required by the sequence of operation.
    - c. The system shall be capable of calculating the enthalpy of a sampled air stream using temperature and humidity inputs. The system shall then be capable of comparing the inputs and initiate an action (such as closing the outside air dampers) as a result of the decision.



10. Demand Controlled Ventilation:

- a. The system shall be able to measure outside air CO<sub>2</sub> and indoor CO<sub>2</sub> (multiple locations) and override outside air damper control on applicable systems to increase O/A intake. Initiation trigger point shall be space concentrations in more than 1,000 PPM above outside air ambient. Once triggered, the system will maintain a differential between outside air ambient and the space of 700 PPM (indicative of 15 CFM/person the referenced space concentration drops below 800 PPM).

11. Custom Applications Program:

- a. Provide a real-time control programming capability to allow operator to create customized control strategies based on arithmetic, logical, conditional, and time logic.

**PART 3 - EXECUTION**

**3.1 LOCATION OF EQUIPMENT**

- A. The drawings and specifications describe approximate locations of the work. Verify all locations in the field.
- B. Locate equipment and accessories to provide easy access for proper service and maintenance.

**3.2 INSTALLATION OF WIRING**

- A. Provide wiring for control devices, monitoring devices, instrumentation, and interlocks as required for a complete system. Coordinate with Plumbing, Electrical and HVAC specifications for devices requiring wiring under this Section.
- B. Run all wiring in compliance with the requirements of the electrical specification (Division 26) Provide separate conduit for control wiring under this Section.
- C. Level 1 data network cable shall be run in conduit. Level 2 networks shall be installed using plenum rated cable, always in EMT where exposed to damage and in all mechanical equipment rooms.

**3.3 INSTALLATION OF CONTROL EQUIPMENT**

- A. Device locations are the responsibility of the Contractor. Group instrumentation on ductwork and fan casing in organized manner. Locations to be consistent for each type of system. Each control device, field or panel mounted, shall be identified by an engraved lamaroid nameplate permanently attached to its enclosure.
- B. Sensors mounted on air ducts having exterior insulation shall be provided with standoff spacers with insulating material firmly fitted around spacers.



- C. Averaging temperature and low temperature detectors shall be installed in serpentine fashion and supported by steel grid or multiple bulb holders. Minimum coverage for temperature sensors shall be 1 linear foot of sensor element per 4 sq. ft. of coil face area. For low limit (freezestats) 1 linear foot of sensor per sq. ft. of coil face area.
- D. The electronic high limit humidity controller must be mounted in the supply fan discharge and at least 10 feet downstream of the humidifier.
- E. Wall mounted sensors shall be 5 ft. - 6 in. A.F.F. 4 ft' - 0 in for ADA Compliance except in service corridors where subject to damage height shall be 7 ft., or if noted otherwise. Coordinate all locations with Commissioner. Provide insulated base where mounting on exterior wall is required. Provide metal guards where mounted in mechanical, electrical, storage, and maintenance areas or in any area where subject to damage.
- F. Locate pressure transducers within 50 ft of sensing point. Connect to sensors with tubing of diameter recommended by sensor manufacturer and as required to prevent signal phase lag. Provide gauge tees at transducer for connection to pressure gauge.
- G. Digital Processing Units and Field Equipment Panels shall be located in approved locations adjacent to system served. Submit all locations for approval after coordination with all other trades.
- H. Panels shall not be located directly underneath valves or other areas where they may be subject to water or heat damage. In addition, panels shall be mounted with the bottom no lower than 3 feet and the top no higher than 7 feet above the floor, with a minimum of 3 foot clearance at the front.

### 3.4 INSTRUCTION

- A. The Contractor shall furnish the services of competent instructors who will give instruction in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment and system specified. The instruction shall be oriented toward the system installed rather than being a general instruction course. Each instructor shall be thoroughly familiar with all aspects of the subject matter they are to teach. All equipment and material required for classroom instruction shall be provided by the Contractor.
- B. The instruction program shall be accomplished in two phases for the time interval specified for each phase.
  - 1. The first phase shall be given prior to the acceptance test period at a time mutually agreeable between the Contractor and the commissioner, and shall be at least five (5) days (8 hours/day) in length. Operating personnel to be instructed in the functional operations of the BMCS installed and the procedures that the operators will employ for system operation. The instruction shall include but not be limited to:
    - a. General BMCS Configuration
    - b. Operation of Computer and Peripherals
    - c. Command Line Mnemonics
    - d. Report Generation



- e. Operator Control Functions
  - f. Graphics Generation
  - g. General equipment layout
  - h. Troubleshooting procedures
  - i. Preventive Maintenance procedures
  - j. Sensor maintenance and calibration
  - k. Proper use of service kit.
2. The second phase shall be conducted after system acceptance testing for a period of three (3) days. The instruction shall include but not be limited to:
    - a. Direct Digital Control and Processing Unit Programming
    - b. Data Base Generation
    - c. Supervisory Level Operator Commands
    - d. Topics requested by City of New York.
- C. The Contractor shall furnish a professional quality video and audio recording of the instruction. The Contractor shall engage the services of a qualified videographer to record demonstration and instruction videos. Record each instruction module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
1. Submit two copies within seven days of the end of each instruction module.
  2. Commissioner may select portions of the instruction to be recorded.
  3. instruction videos shall be delivered to City of New York in the MP4 file format container with MPEG-4 video.
  4. Electronic media shall be read-only format compact disc, with commercial-grade graphic label including the following information.
    - a. Name and Address of Project
    - b. Name and Contact Info of Videographer
    - c. Name of Commissioner
    - d. Name of Construction Manager
    - e. Name and Contact info of Installing Contractor



- f. Date of Video Recording
- 5. Organize folder structure and file locations according to Operating and Maintenance Manual table of contents; confirm with commissioner. Provide complete screen-based menu.
- 6. Use file names based upon name of equipment generally described in video segment, as identified in Project specifications.

### **3.5 CALIBRATION**

- A. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets that shall be submitted prior to acceptance testing. Notify the City of New York in writing of the testing schedule so that operating personnel may observe calibration and commissioning.
- B. Field I/O Calibration and Startup
  - 1. Prior to system program commissioning, verify that each control panel has been installed according to the shop drawings and test, calibrate, and bring on-line each control device. Commissioning to include but not be limited to:
    - a. Sensor accuracy at 10, 50 and 90% of range.
    - b. Sensor range.
    - c. Verify analog limit and binary alarm reporting.
    - d. Point value reporting.
    - e. Binary alarm and switch settings.
    - f. Actuator spring ranges.
    - g. Failsafe position on loss of control signal or electric supply.
  - 2. Record calibration and test data on commissioning data sheets and submit. Data sheets shall include the device designation, the date of commissioning and the name of person who performed commissioning.
- C. Fan Speed Control Without Air Flow Sensors (If Applicable)
  - 1. The Contractor shall work closely with the all subcontractors to setup fan tracking per the following procedure.
    - a. With return fan at minimum speed, set supply fan to produce volume equal to system differential. Record SF output signal.
    - b. Increase supply fan output signal 20% and raise return fan speed until differential is once again obtained. Record return fan output signal.



- c. Continue this procedure until the supply fan is at full speed. Set all values in a look-up table so fans will track accordingly.
- d. Vary the speed of the supply fan and verify fans are tracking with the proper differential.

**D. System Program Commissioning**

- 1. After control devices have been commissioned, each Direct Digital Control and Processing Unit program shall be put on-line and commissioned. The contractor shall confirm that the Direct Digital Control and Processing Unit program logic follows the approved software flow chart and sequence of operation. Each control loop shall be adjusted to provide stable control and control within the specified accuracies. System program test results and loop adjustments shall be recorded on commissioning data sheets and submitted.
- 2. The sequences of operation are subject to commissioner onsite approval, modification, and change. Changes to the sequences of operation shall be performed by contractor at no additional expense.

**E. Integrated System Commissioning**

- 1. After all Direct Digital Control and Processing Unit programs have been commissioned, the contractor shall verify the overall system performs as specified. Tests shall include but not be limited to:
  - a. Data communication, both normal and failure modes
  - b. Fully loaded system response time
  - c. Impact of component failures on system operation
  - d. Time/date changes
  - e. End of month/end of year operation
  - f. Global application programs
  - g. System backup and reloading
  - h. System status displays
  - i. Diagnostics
  - j. Power fail/restart
  - k. Battery backup

**F. Non-Direct Digital Control Subsystems**

- 1. Subsystems not controlled by direct digital control shall also be tested and commissioned.



**3.6 ACCEPTANCE TESTING**

- A. The contractor shall provide all manpower as required to perform testing and coordinate with contractors to provide necessary support for complete testing of all system parameters.
- B. Submit a detailed acceptance test procedure designed to demonstrate compliance with contract requirements at least 4 weeks before the start of testing. This procedure to be approved prior to the start of the testing.
- C. During acceptance testing provide services of a fully qualified building automation technician who is knowledgeable of the project.
- D. Using the calibration test data, the commissioner shall select, at random, functions to be demonstrated. These functions shall be demonstrated by the Contractor in accordance with the acceptance test procedure. At least 15 percent of the systems functions as selected by the Commissioner shall be demonstrated. At least 95% of the functions demonstrated must perform as specified and documented on commissioning data sheets or the system must be retested.
- E. Furnish instruments required for testing. Submit catalog data on all instruments for approval prior to performance of tests.

Instrument Accuracy	
Temperature:	¼°F or 1/2% of full scale, whichever is less
Pressure:	½% PSI or 1/2% of full scale, whichever is less
Humidity:	2% RH
Electrical:	Class 0.5

- F. After the above acceptance tests are complete and the system is demonstrated to be functioning as specified, a thirty-day endurance test period shall begin. If the system functions as specified throughout the endurance test period requiring only routine maintenance and adjustment, the system shall be accepted. If during the endurance test period the system fails to perform as specified and cannot be corrected within eight hours, the commissioner may request that the endurance tests be repeated after problems have been corrected.

**3.7 AUTOMATIC CONTROL SEQUENCES**

**A. General**

- 1. Supply, install necessary sensing, controlling and controlled devices, piping, wiring and commissioning of automatic control systems, so as to provide a complete control system, meet requirements of control sequences hereinafter specified, as noted, and in accordance with Contract Documents.
- 2. Contractor to customize control strategies and control sequences and be able to define appropriate control loop algorithms and choose the optimum loop parameters for loop control. All control loops shall be tuned to stabilize within ±1% of setpoint within 5 minutes of setpoint change or system startup.



3. Safety devices shall be hardwire interlocked with "hand" and "automatic" positions in series with motor controller holding coil circuit.
4. Startup sequences and automatic control sequences as described on hereinafter shall operate in both automatic and manual modes.
5. Smoke control and life safety sequences shall override other automatic control sequences including hardwired safety devices.
6. Reset schedules and setpoints shown in sequences are for initial programming and start-up, during system check out and through the guarantee period, the reset schedules and setpoints shall be fine-tuned to obtain desired comfort and energy results.
7. The output of the reset schedules should be limited between maximum and minimum values. The intent of the reset schedules indicated is that the range of the output be limited between the minimum and maximum values indicated in the reset schedules.
8. All functions which use analog points to switch equipment on and off (e.g., fans, pumps) must be programmed with dead bands, and if necessary, time delays to prevent short cycling of equipment. Alarms generated through analog limits as noted in the sequence of operation and where required for proper annunciation of an alarm condition shall be programmed by the contractor at startup.
9. The following control sequences, control loops and operational data define the manner by which the project mechanical systems shall function to maintain the environmental conditions described herein.
10. The monitoring and control point list is the Commissioner's estimation of the points required to successfully control a particular system as specified. The contractor is responsible to provide all hardware, control loops, and points required to provide a complete and operational system as specified.
11. The specified control sequences refer to the application programs described above. Refer to that Section for more detailed information regarding the requirements of a specific application program.
12. All control setpoints and variables shall be fully adjustable in the field through the use of a portable terminal or lap top computer.
13. On all systems containing both cooling and heating coils (except in reheat position), the heating coil control valve shall be closed whenever cooling coil is activated and vice versa.
14. Variable frequency drives will start in minimum speed position and ramp up to speed over a two-minute adjustable ramp time (minimum).
15. All zone loop controllers shall incorporate control error reduction. Where used to control heating and cooling, zone thermostatic control shall incorporate deadband control of at least 5 degrees F. where the heating and cooling energy to the zone is shut off or reduced to a minimum. Refer to individual sequences of operation for exceptions to this requirement (if any).



16. Motor status for all motors smaller than 1 HP shall be binary current switches mounted on the motor power leg. All motors 1 HP and above (unless otherwise stated) shall be obtained via analog current sensors mounted on the motor power leg. The sensor shall be calibrated for normal operation and abnormal operation based upon low, normal, and high current sensed. The input from the sensor shall be programmed with analog alarm limits to indicate sensor failure or loss of power (0 mA), motor off (4 mA), motor running (mA = Normal Running Amps  $\pm$  5 amps) and motor overloaded (mA = Normal Running Amps + 10 amps).

### **3.8 SEQUENCES OF OPERATION FOR SYSTEMS**

- A. Refer to contract drawings for sequences of operation.

**END OF SECTION 23 09 23**



**SECTION 23 11 13  
SHEET METAL, DUCTWORK AND ACCESSORIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].
- B. Provide all ductwork required to make the various air conditioning, ventilating and heating systems complete and ready for operation.

**1.2 WORK INCLUDED**

- A. Section Includes:
1. Single-wall rectangular ducts and fittings.
  2. Double-wall rectangular ducts and fittings.
  3. Single-wall round flat-oval ducts and fittings.
  4. Double-wall round flat-oval ducts and fittings.
  5. Sheet metal materials.
  6. Flexible connectors.
  7. Access doors in sheet metal.
  8. Turning vanes.
  9. Belt guards.
  10. Plenums and equipment casing.
  11. Auxiliary Drain pans.



12. Wire mesh screens.
13. Sealants and gaskets.

### **1.3 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 the "DUCT SCHEDULE" section of this submittal.
- B. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

### **1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit a line-by-line statement of compliance / non-compliance / deviation for each clause of this specification section.
- C. Certificates / Product Data
  1. Welding certificates.
  2. Prior to ductwork fabrication, submit to the Commissioner for review certifications and data on all sheet metal materials proposed for use (Mill certificates, galvanizing, etc.).
  3. Sealants and gaskets.
- D. Shop Standard / Details Submittal
  1. Submit sheet metal shop details for approval before any duct layouts are submitted for review. Shop drawings will not be acted on before shop details have been reviewed.
  2. Sheet metal shop details shall include:
    - a. A chart listing each ducting system to be installed on the project similar to the "DUCT SCHEDULE" section of this specification.
    - b. Joint and seam construction and sealing.
    - c. Reinforcement details and spacing.
    - d. Damper construction.
    - e. Plenum wall construction.
    - f. Access door construction.



- g. Fitting construction.
- h. Materials, fabrication, assembly, and spacing of hangers and supports.

**E. Shop Drawings**

1. Submit computer generated drawings of all ductwork drawn to a scale of 3/8" to the foot for approval. Ducting layouts shall be submitted for each individual phase of the project and for the entire completed project. Shop drawings shall include:
  - a. Ductwork plans, elevations, sections, components, and attachments to other work.
  - b. Duct layouts indicating duct system, duct sizes, configuration, duct liner, static-pressure classes, elevations, dimensions of main duct runs from building grid lines, fittings and accessories including dampers, turning vanes and access doors / panels, reinforcement and spacing, and penetrations through fire-rated and other partitions.
  - c. Equipment layouts shall be based on actual equipment being used on Project.
  - d. Hangers and supports, including methods for duct and building attachment, seismic restraints and vibration isolation. Submit plan drawings showing duct point loads to structure and supplementary steel layouts for all systems.
2. Submit drawing of location and size of sleeves for openings in floors and walls.

**F. Samples**

1. Submit samples of ducting and special materials, as required by the Commissioner.
2. Submit samples of sheet metal (each gauge), ducting and special materials, as required by the Commissioner.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Construct ductwork according to the pressure-velocity classifications established by SMACNA's "HVAC Duct Construction Standards - Metal and Flexible", and as called for on the duct drawings.
- C. 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.
- D. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."



- E. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."
- F. Comply with OSHA standards and requirements.

## **PART 2 - PRODUCTS**

### **2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class – but no less than 2” – unless otherwise indicated.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," chapter for "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### **2.2 DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS**

- A. Rectangular Ducts: Fabricate ducts with indicated dimensions for the inner duct.
- B. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Inner Duct: Minimum 0.028-inch solid sheet steel.



- F. Interstitial Insulation: Interstitial Insulation: in accordance with the ductwork insulation requirements as indicated in Specification 23 07 00 - Insulation.
- G. Formed-on Transverse Joints (Flanges): Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- H. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### **2.3 SINGLE-WALL ROUND DUCTS AND FITTINGS**

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," chapter for "Round, Oval" based on indicated static-pressure class unless otherwise indicated.
- B. Flat-Oval Ducts: Indicated dimensions are the duct width (major dimension) and diameter of the round sides connecting the flat portions of the duct (minor dimension).
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 1. Transverse Joints in Ducts Larger than 60 inches in Diameter: Flanged.
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
  - 1. Fabricate flat-oval ducts larger than 72 inches in width (major dimension) with butt-welded longitudinal seams.
- F. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "90 Degree Tees and Laterals," and figure for "Conical Tees," 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."

### **2.4 DOUBLE-WALL ROUND DUCTS AND FITTINGS**

- A. Flat-Oval Ducts: Indicated dimensions are the duct width (major dimension) and diameter of the round sides connecting the flat portions of the duct (minor dimension) of the inner duct



- B. Outer Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," chapter for "Round, Oval" based on static-pressure class unless otherwise indicated.
1. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
    - a. Transverse Joints in Ducts Larger than 60 inches in Diameter: Flanged.
  2. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
    - a. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
    - b. Fabricate flat-oval ducts larger than 72 inches in width (major dimension) with butt-welded longitudinal seams.
  3. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "90 Degree Tees and Laterals," and figure for "Conical Tees," 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. Inner Duct: Minimum 0.028-inch solid sheet steel.
- D. Interstitial Insulation: in accordance with the ductwork insulation requirements as indicated in Specification 23 07 00 - Insulation.
1. Install spacers that position the inner duct at uniform distance from outer duct without compressing insulation.
  2. Cover insulation with polyester film complying with UL 181, Class 1.

## **2.5 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" section of this specification; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "DUCT SCHEDULE" section of this specification.
- E. Aluminum Sheets: Comply with ASTM B 209 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.

## **2.6 FLEXIBLE CONNECTORS**

- A. Construct flexible connectors as follows:
  - 1. Indoor low-pressure systems: glass fabric double coated with neoprene.
  - 2. Medium pressure systems, high pressure systems: glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone
  - 3. Flexible connections must be suitable for the operating pressure and temperature of the system in which they are installed.

## **2.7 ACCESS DOORS IN SHEET METAL**

- A. Access doors in ductwork:
  - 1. Where required in ductwork or casings, provide suitable latch type access doors and frames to permit inspection, operation and maintenance of apparatus concealed behind the sheet metal work.
  - 2. Provide access doors in insulated ducts of insulated double panel construction and same material as the duct.
  - 3. Provide access doors in uninsulated ducts of single panel construction equal and same material as the duct.
  - 4. Provide all access doors with sponge rubber gaskets around their entire perimeter.
  - 5. Where required in ducts carrying humid air, or grease laden air, locate access doors in the side of ducts.



6. Fabricate access panels in ductwork according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; figure for "Duct Access Doors and Panels," and figure for "Access Doors - Round Duct."

B. Access doors in plenums / casing:

1. Install hinged walk-in type casing access doors where required and indicated on the Drawings.
2. Fabricate access panels in plenums and casing according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; figure for "Casing Access Doors - 2in," figure for "Casing Access Doors 3-10in," and table for "Plenum and Casing Access Doors."

## 2.8 TURNING VANES

- A. Provide curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
- B. For acoustic turning vanes, fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.
- C. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; figure for "Vaness and Vane Runners," and figure for "Vane Support in Elbows."
- D. For square elbows, use single thickness vanes for ducts up to 18 inches wide and double thickness airfoil vanes in ducts over 18 inches wide.
- E. Construct turning vanes of the same material as the ductwork in which they are installed.

## 2.9 BELT GUARDS

- A. Provide guards on all belt drives.
- B. Provide split type with tachometer opening at shafts fabricated from galvanized metal and braced to prevent rattling.
- C. Use solid or expanded metal on motors up to 5 horsepower.
- D. Use expanded metal on motors 7½ horsepower and up.
- E. Use angle frames on motors 25 horsepower and larger.
- F. Provide sufficient space so that sheaves can be changed to larger sizes



## **2.10 PLENUMS AND EQUIPMENT CASING**

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," chapter for "Equipment and Casings," for acceptable materials, material thicknesses, and casing construction methods unless otherwise indicated.
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for sheet metal thickness based on indicated static-pressure class unless otherwise indicated.
- C. Fabricate casings with standing seams and angle-iron reinforcements unless otherwise indicated.
- D. Reinforce casings with galvanized-steel angles.
- E. Small plenums:
  - 1. Provide discharge and intake air plenums for connecting the fresh air intake and discharge openings to the various systems, as shown on the Drawings, of insulated double wall aluminum construction.
  - 2. All other air plenums to be single-casing construction.
- F. Large plenums:
  - 1. Provide large walk-in air plenums of insulated double-wall construction.
  - 2. Construct the casing panels of two sheets of galvanized sheet steel: the outer sheet (outdoor) solid 20 gauge, the inner sheet (mechanical room) solid 16 gauge. Use Owens Corning, Johns Manville, CertainTeed or approved equal 4 inch thick fibrous glass, 6 pound per cu. ft. density insulating board between these sheets.
- G. Equipment casing:
  - 1. Provide air chambers for field assembled air supply apparatus, and as shown on the Drawings, entirely of insulated double-wall casing construction.
  - 2. Construct the casing panels of two sheets not less than 20 gauge galvanized sheet steel: the outer sheet solid, the inner sheet perforated. Use 4 inch thick fibrous glass, 6 pound per cu. ft. density insulating board between these sheets

## **2.11 AUXILIARY DRAIN PANS**

- A. Construct drain pans of 16 gauge galvanized steel with all joints brazed. Construct pans watertight with hemmed edges.
- B. Provide auxiliary drain pans under any equipment for which a pan is shown on the Drawings, and under all horizontal air handling units, condensate producing heat exchangers, duct mounted hot water or chilled water coils located above hung ceilings or electrical equipment, piping over electrical equipment, etc.
- C. Extend the auxiliary drain pan at least 6" beyond the equipment it is serving.



- D. Drain pan shall be at least 2" high.
- E. Drain pan shall be sloped at least 0.125" per foot from the horizontal toward the drain outlet.
- F. Provide drain pipe outlet at the lowest point (s) of the drain pan with a connection size of at least 3/4", or as shown on the Drawings.
- G. Route the galvanized steel or Type "L" copper tube to the nearest equipment room floor or hub drain independent of any air handling unit drains.

#### **2.12 WIRE MESH SCREENS**

- A. Furnish and install all wire mesh screens indicated in the Construction Documents.
- B. Fabricate frame of extruded aluminum with mitered reinforced corners.
- C. Provide non-rewireable frame with permanently secured screen mesh.
- D. Provide mesh of ½ inch square, .063 inch intercrimped aluminum wire.

#### **2.13 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. Sealant to be water based, fast curing to a firm rubbery seal, and have gap filling properties with smooth easy caulking characteristics.
- C. Follow the manufacturer's application instructions.
- D. Solvent based sealants are permitted only for ductwork that will be sealed during freezing conditions when a water based sealant will not be effective.
- E. Sealant Manufacturers:
  - 1. Childers CP-146
  - 2. Foster 32-19
  - 3. MEI 44-39
  - 4. Hardcast Iron-Grip 601
  - 5. Or approved equal
- F. Gaskets shall be Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.



## **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 and where necessary to accommodate conditions arising at the building.
- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated. Execute the Work in strict accordance with the best practices of the trade and with these Specifications.
- C. Duct sizes indicated in the Drawings for internally lined ducts are the net duct dimensions. Increase ducts in both dimensions by twice the thickness of the liner making the actual sheet metal dimension larger by thickness of the liner.
- D. Install round and flat-oval ducts in maximum practical lengths.
- E. Install ducts with fewest possible joints. Make joints and seams smooth on the inside and a neat finish on the outside. Make duct joints airtight with laps made in the direction of air flow and no flanges projecting into the air stream. Provide ducts adequately braced to prevent vibration. Provide intermediate reinforcing and/or tie rod construction where necessary.
- F. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- G. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- I. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- J. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.
- K. All welds on welded stainless steel duct to be pickled to remove weld oxide. Passivate stainless surface after welding to remove embedded foreign material.
- L. Install duct connected grilles, registers and ceiling diffusers shown on the Drawings. Exact dimensions of openings must await approval of registers and diffusers. Submit exact locations for approval. Do not cut joints for the installation of outlets.
- M. Where possible, fabricate all ductwork in such a manner that seams and/or joints will not be cut for the installation of grilles, registers, or ceiling outlets. If cutting of seams or joints is unavoidable, properly reinforce the cut portion to original strength



- N. Wherever it may be necessary to make provision for vertical hangers of the ceiling construction passing through ducts, provide streamlined shaped sleeves around such ceiling construction hangers. Make all such streamlined sleeves airtight at top and bottom of ducts.
- O. Do not suspend ductwork or any device, or allow work installed by any trade to be suspended from ductwork (for example: lighting conduit, lighting fixtures, piping, ceiling construction, etc.).
- P. 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.
- Q. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers and / or fire smoke dampers as required by NYC Mechanical, Fire, Building Code and Specification 23 33 13 – Dampers.
- R. Provide approved firestopping material around all ducts penetrating floors, walls, roofs, etc., in accordance with NFPA, and Commissioner's requirements.
- S. Provide any ductwork passing through waterproof walls or roof construction with counter flashing.
- T. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Cap openings in ducts during progress of construction tightly. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."
- U. Thoroughly clean the interior of all ductwork after installation, and prior to use. Operate all fans and remove all debris and foreign matter from the duct.
- V. Replace, without any additional cost to the contract, any ductwork or components found to be noisy after installation, with said noise resulting from faulty materials or workmanship.

### **3.2 INSTALLATION OF EXPOSED DUCTWORK (INDOORS)**

- 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.
- F. Coordinate painting of ductwork with the Commissioner's requirements.

### **3.3 CONNECTIONS**

- A. Make connections to equipment with flexible connectors.
- B. Flexible connections to be approximately 6 inches long, after installation is complete securely held in place with heavy metal bands to prevent any leakage. Align ductwork and fans to be plumb prior to connection. Allow at least 1 inch of slack.
- C. Provide flexible connection in ductwork connected to the inlets and/or outlets of all air handling units, fans, etc., except fan air handling units with internal isolators and flexible fan connections. Overlap ends of fabric 2" and contact glue. Sewing or stapling will not be permitted. Allow at least one inch slack in all flexible connection installations to insure that no vibration is transmitted.
- D. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

### **3.4 ACCESS DOORS IN SHEET METAL**

- A. 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. Upstream or downstream from duct silencers.
  - 10. Control devices requiring inspection.
  - 11. Elsewhere as indicated
- B. Install access doors with swing against duct static pressure.



- C. Provide access doors not smaller than 18 inches by 18 inches. Ducts smaller than 18 inches are to be provided with access doors 2 inches smaller than the width by 18 inches long.
- D. Where removable hung ceiling panels are installed below access doors, provide markers showing the access door location clearly.
- E. Label access doors according to Specification 23 05 53 "Systems Identification" to indicate the purpose of access door.

### **3.5 PLENUMS AND EQUIPMENT CASING**

- A. Install casings according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal all penetrations airtight. Cover with escutcheons and gaskets, or fill with suitable compound so there is no exposed insulation. Apply sealant to joints, connections, and mountings.
- C. Field-cut openings for pipe and conduit penetrations; insulate and seal according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Support large casings on floor or foundation system. Secure and seal to base.
- E. Support components rigidly with ties, braces, brackets, and anchors of types that will maintain housing shape and prevent buckling.
- F. Small plenums:
  - 1. Provide standing seams with additional right-angle bend and cap with No. 18 gauge galvanized "U" cap galvanized steel plenums for in-line centrifugal and axial flow fans.
  - 2. Provide the number of access doors as shown on the Drawings, minimum of one (1), for each sheet metal plenum.
  - 3. Provide drain pan construction for air intake and discharge plenums; apply two (2) coats of mastic sealant to all joints; pitch bottoms for effective drainage.
- G. Large plenums and equipment casing:
  - 1. Butt top edges of vertical panel into the bottom of the horizontal or sloping top panels with the joint fully caulked. Form the interior top and bottom edges of the casing with continuous angle, caulked where it adheres to casing. Form panels occurring at corners of casings to "L" shape so that no joint occurs at such corners. Make vertical and horizontal seams (connecting any panels) with caulked 1½ inches by 1½ inches by ½ inch angles. In addition, provide necessary internal structural bracing members.
  - 2. Caulk joints to make them airtight. Gasket the bottoms of air chambers at the curb to prevent air leakage. Provide knee braces and additional bracing for chamber roofs, as required, to prevent sagging.



3. Place longitudinal reinforcing angles on the inside of the casing in accordance with the following schedule:

Height of Side Walls or Width of Roof	Number Angles	Angle Spacing
Up to 6 feet	0	--
6 feet to 8 feet	1	Middle
8 feet to 12 feet	2	1/2 points
Over 12 feet	Variable centers	4 feet

4. Provide angle size of 1½ inches by 1½ inches by 1/8 inch to 12 feet casing length, and 1-3/4 inches by 1 3/4 inches by 3/16 inch over 12 feet casing length.
5. Size mixed air plenums for air handling units to prevent stratification across coils. Install baffles as required to maintain plus or minus 5°F temperature variation across coil face area.

**3.6 DUCT SEALING**

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in the "DUCT SCHEDULE" section of this specification according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Ductwork leakage in excess of SMACNA Standards for the seal class listed will not be acceptable. Seal ductwork and seams with an approved sealant as required to comply with this leakage requirement.
- C. Clean and dry all surfaces thoroughly prior to application.
- D. Apply with caulking gun, trowel or spatula.
- E. Join surfaces to be sealed immediately after application of sealant.
- F. Follow manufacturer's instructions carefully for application, storage and cleanup.
- G. Do not use sealant which is beyond manufacturers recommended shelf life.

**3.7 DUCT MOUNTED SMOKE DETECTORS**

- A. Duct mounted smoke detectors are provided by Division 26 and installed by Division 23. Locate duct mounted smoke detectors in the ductwork in accordance with the manufacturer's recommendations, the requirements of NFPA.

**3.8 DUCT SCHEDULE**

- A. The ductwork on this project falls into classifications as indicated below. Follow SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for material gauge unless otherwise noted.



Ductwork / System	Pressure Classification "W.G."	Seal Class	Duct Material	Material Gauge
Downstream of fan-powered terminals.	+1"	A	Galvanize Sheet Steel	SMACNA
Ductwork on the discharge of air handling units, except outside air handling units.	+2"	A	Galvanized Sheet Steel	SMACNA
Outside air and toilet exhaust ductwork on the building side of the volume damper on each floor.	+2" & -2"	A	Galvanized Sheet Steel	SMACNA
Outside air makeup and exhaust duct for smoke exhaust systems.	+2" & -2"	A	Galvanized Sheet Steel	SMACNA
Outside air handling unit discharge ductwork, risers, and ductwork to the volume damper on each floor.	+3"	A	Galvanized Sheet Steel	SMACNA
Toilet exhaust ductwork, risers, and runouts to the volume damper on each floor.	-3"	A	Galvanized Sheet Steel	SMACNA

B. Comply with the pressure class and seal class listed for the construction in each classification. Cross-break or use mechanical transverse beading on rectangular ductwork 12" and wider and install as indicated on the Drawings and as specified. Make beading at least 1/16" deep at the center of the bead and a maximum of 3/8 inch wide at the base of the bead.

C. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "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 for "Vanes and Vane Runners," and figure for "Vane Support in Elbows."
2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Round Duct Elbows."



- a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," table for "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 and Larger in Diameter: Standing seam.

**D. Branch Configuration:**

- 1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "Branch Connection."
  - a. Rectangular Main to Rectangular Branch: 45-degree entry.
  - b. Rectangular Main to Round Branch: Spin in.
- 2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," figure for "90 Degree Tees and Laterals," and figure for "Conical Tees." Saddle taps are permitted in existing duct.
  - a. Velocity 1000 fpm or Lower: 90-degree tap.
  - b. Velocity 1000 to 1500 fpm: Conical tap.
  - c. Velocity 1500 fpm or Higher: 45-degree lateral.

**END OF SECTION 23 11 13**



**Department of  
Design and  
Construction**

FMS No. S136-383S  
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**SECTION 23 21 23  
PUMPS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide pumps in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Vertically Mounted Pumps.
- B. Horizontally Split Case Pumps.
- C. End Suction Base Mounted Pumps.
- D. In-line Pumps.
- E. Condensation Pump Units.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's latest data.
- C. Shop drawing submittals to indicate certified pump curves NPSH, pump performance characteristics with pump and system operating points plotted.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Select pumps to operate at or near their point of peak efficiency, allowing for operation at capacities of approximately 25% beyond design capacity. In addition, select the design impeller diameter so that the design capacity of each pump (GPM and TDH) does not exceed 85% of the capacity obtainable with maximum impeller diameter at the design speed for that model.
- C. In order to insure stable operation and to prevent any possibility of hunting, the pump curve must be continuously rising from maximum capacity up to the shutoff point.
- D. Make the entire pump assembly including, but not limited to, the casing or enclosure, suction and discharge flanges, and seals, suitable for operation with the "Pump Working Pressure" and temperatures indicated on the Drawings. For the purpose of this specification, the pump working pressure is defined as the sum of the scheduled maximum suction pressure and the maximum dynamic head at shutoff developed by the pump for pumping duty specified. Test each entire pump assembly hydrostatically at the factory at least 50 psig pressure above the pump working pressure.
- E. Perform a complete factory electric operating and sequence test, capacity performance test, and hydrostatic test for each factory assembled pumping system prior to shipment. Include a system operating flow test from zero to 100% of design flow for the pumping unit with the specification suction and net discharge pressure conditions specified on the Drawings. Verify the accuracy of the system flow meter with an independent calibrated test flow meter. The factory operating and performance test may be witnessed by the Commissioner. Notify the commissioner in writing at least three (3) weeks prior to the factory performance test. Before the pumping assembly is shipped from the factory, transmit certified factory performance test data for factory testing including flow, head, and horsepower at all flow rates on a plot of the system flow test. Certify that the pumps have been satisfactorily tested as specified hereinbefore and are in compliance with the requirements of the Contract Documents. Do not install the pumping system before the test data has been reviewed by the Commissioner.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Provide pressure gauge tap and cock on suction and discharge connection of each pump.
- B. Motors to be of such size that they will operate continuously without exceeding it's H.P. rating, exclusive of service factor, at design capacity and head.
- C. Provide pump casing of close grained cast iron free from blow holes, sand pockets and other detrimental defects. Liquid passageways to be smooth and contoured to permit maximum efficiency. Casing to be designed for working pressure as scheduled and to be hydrostatically tested at 150% of the maximum working pressure. Suction and discharge flanges to be drilled to ANSI standards for operating pressure specified.
- D. Provide on the mechanical seals for each open system water pump, an impurity eliminator type that is constructed throughout of 316 stainless steel and suited to the system scheduled working pressure. Factory pipe the impurity eliminator and provide with isolating ball valves and valved bypass piping. Piping to be Schedule 40 galvanized steel pipe.



- E. The impeller supplied for the specified conditions to limit shaft deflection at the seal to no more than .002 inches.
- F. For vertical, horizontal split, in-line, and end suction pumps, manufacturers are:
  - 1. Armstrong
  - 2. Bell & Gossett
  - 3. Buffalo Pump
  - 4. Weinman
  - 5. Paco
  - 6. Peerless Pump
  - 7. Ingersoll Dresser
  - 8. Or approved equal

## **2.2 VERTICALLY MOUNTED PUMPS**

- A. Provide pumps of the close coupled type with gray iron casing. Bronze impeller, bronze replaceable wear ring, stainless steel pump shaft and mechanical seal vented to suction with copper tubing.
- B. Motor shall be mounted on a separate adjustable steel frame with lifting holes or lugs on the top and sides and a drip base drain. The pump shall be permanently bolted and doweled to the frame at the factory.
- C. Provide a spacer type coupling to permit easy seal replacement.
- D. Provide a thrust bearing and thrust collar sleeve to prevent the rotating assembly from dropping on a bearing failure.
- E. Mechanical seal shall be single spring inside type with carbon against O-ring mounted Ni-Resist faces. EPDM elastomer with stainless steel spring and hardware shall be provided. Seal vent line shall be factory installed and shall be piped from the seal area to the pump suction connection.
- F. A bronze shaft sleeve, extending the full length of the mechanical seal area, shall be provided.

## **2.3 HORIZONTALLY SPLIT CASE PUMPS**

- A. Provide pumps of the single-stage horizontal split case type with the split on the horizontal axis. Suction and discharge connections to be located on opposite sides of the lower half casing, allowing removal of the rotating element without disturbing the system piping connections. Pump speed not to exceed 1750 rpm. The maximum brake horsepower requirements of the pump are to be below the service factor rating of the driver.



- B. Mount pump and motor on a common fabricated structural steel base furnished by the pump manufacturer. Provide in the base provisions for grouting and anchor bolts. Machine surfaces for the motor and pump mounting. Motor mounting to permit horizontal adjustment. Provide the base of sufficient strength to prevent vibration, warping, or misalignment of the pump and motor when installed without grouting.
- C. The impeller to be of the double suction type, made of cast bronze, and balanced hydraulically, statically, and dynamically. Key the impeller to the shaft and securely retain in an axial position by positive mechanical means.
- D. Seal the pump liquid cavity with a face type mechanical seal with Ni-Resist stationary seat, carbon washer, ethylene propylene flexible members, brass metal parts and 18-8 stainless steel spring. Seal to be mounted over a bronze shaft sleeve.
- E. Provide stainless steel pump shaft adequately supported by the pump bearings to limit the shaft deflection to .002 inches. Bearings to be the ball type, grease lubricated and locked to the shaft with positive locks of ample size to withstand any axial thrust loads. Bolt each bearing housing to the upper and lower casing halves for a full 360 degree support registered fit to insure positive alignment. Bearings to provide a minimum 100,000 hours average bearing life.
- F. Firmly attach bronze shaft sleeves to the pump shaft through threading and locking means. Shaft sleeve design shall prevent corrosion and wear to the shaft.
- G. Provide a flexible coupling. Each pump mounted with a driver to be equipped and shipped from the manufacturer with a coupling guard in place.

#### **2.4 END SUCTION BASE MOUNTED PUMPS**

- A. Provide end suction, vertically split case centrifugal type pumps.
- B. Pump casing to be fitted with a bronze replaceable wearing ring.
- C. Pump shaft to be stainless steel of a size and design to limit shaft deflection at the seal to no more than .002 inches.
- D. Seal the pump liquid cavity with a face type mechanical seal with Ni-Resist stationary seat, carbon washer, ethylene propylene flexible members, brass metal parts and stainless steel spring. Seal to be mounted over a bronze shaft sleeve.
- E. Couple the pump flexibly to a NEMA frame ODP electric motor. Motor and pump bearing to be grease lubricated and sized for a minimum of 100,000 hours average bearing life. Motor and pump to be aligned and mounted on a steel base. Provide a coupling guard.
- F. Mount pump and motor on a common fabricated structural steel base furnished by the pump manufacturer. Provide in the base provisions for grouting and anchor bolts. Machine surfaces for the motor and pump mounting. Motor mounting to permit horizontal adjustment. Provide the base of sufficient strength to prevent vibration, warping, or misalignment of the pump and motor when installed without grouting.

## 2.5 IN-LINE PUMPS

- A. Provide vertical in-line bronze fitted, single stage, centrifugal pumps, close-coupled to a ball-bearing, drip proof totally enclosed NEMA standard vertical electric motor.
- B. Models 3 inch and larger to have balanced double volute design to minimize radial shaft deflection. Suction and discharge connections to be the same size, flanged 125 PSI rating, 180 degrees opposite on centerline for pipeline mounting. Casing to have bronze replaceable wear ring. Impeller to be bronze, enclosed, statically, dynamically, and hydraulically balanced. Motor shaft to be one-piece stainless steel. Pump to have mechanical shaft seal of the Ni-Resist type and be properly vented to the suction connection.
- C. When in-line pumps are horizontally mounted, support them from overhead.

## 2.6 CONDENSATION PUMP UNITS

- A. Provide ½ gallon nylon tank with float operated switch.
- B. Pump to be cast aluminum with epoxy coating and ¼" MNPT discharge connection.
- C. Motor to be 120 volt, 1/40 horsepower.
- D. Overall height to be maximum of 6".
- E. Manufacturer to be Little Giant Model VCMA, Beckett CB, Diversitech CP or approved equal.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Rigidly bolt the pump base to the vibration isolation base and fill with concrete or grout after installation on the isolation base. After final alignment, dowel all pumps and motors 25 horsepower and over to the base. All vertically mounted pumps to be doweled into place after final alignment.
- B. The pump manufacturer to be responsible for aligning in the field prior to startup of flexibly coupled pumps. Alignment to be with dial indicator with accuracy of plus or minus .002 inch. The pump manufacturer must submit a written report certifying that the alignment work has been performed by his personnel and that the pumps are ready for operation.
- C. Pumps to be leveled up on tapered steel wedges in such manner to permit a minimum of 3/4 inch of grout between the pump base and the top of the concrete base.
- D. Pump motors are to be covered during construction period and if the motor has to be run the Mechanical Subcontractor will be responsible to make sure that the area in which the motor is running is clean.
- E. Mechanical Subcontractor to provide lifting eye ring above each vertical in-line pump to facilitate removal of motors for repair.



- F. Paint the entire assembly of each pump with two coats of enamel after shop testing.
- G. All operating controls and safety devices must be demonstrated after each system has been installed and put into operation at the project site.
- H. Provide drains for bases and stuffing boxes piped to discharge into floor drains.
- I. Provide air cock and drain connection on horizontal pump casings.
- J. Provide pumps with bronze mesh start-up strainers. Mechanical Subcontractor to remove fine mesh strainer after system has been flushed.

**END OF SECTION 23 21 23**



**SECTION 23 25 00  
PIPE CLEANING AND CHEMICAL WATER TREATMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide flushing, cleaning and chemical treatment program in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Pipe Cleaning.
- B. Cleaning Chemicals.
- C. Water Treatment Chemicals.
- D. Chemical Feed Equipment.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit shop drawings listing chemicals and services provided for all systems. Provide layouts of feeding equipment, details of equipment and describing treatment program, including calculations and quantities of chemicals to be used. Provide system schematics showing the following:
  - 1. Chilled and Hot Water Systems:
    - a. volume
    - b. pressures
    - c. circulation rate
    - d. temperature differentials



- C. Provide written report containing log and procedure of system cleaning, giving times, dates, problems encountered and condition of water.
- D. Provide inspections and submit written reports as necessary to complete the work. Provide for one (1) year after substantial completion of system. Take samples of water at each inspection, analyze, and certify. Submit the analysis made on the water to the Commissioner. Include in the analysis report, recommendations as to any changes in water treatment required. Provide an initial dosage of 1.5 gallons of an aqueous solution of sodium nitrite base corrosion inhibitor (Nalco 2536, Dow Chemical, DuPont), or approved equal, for each 100 gallons of water in the system.
- E. Provide written maintenance instructions to be included in Maintenance and Operating Manual.

#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Retain a water treatment company, approved by the City of New York, to provide water treatment, feed equipment, testing equipment and chemicals for the systems as defined herein and as may be required to maintain the integrity of the piping systems and mechanical equipment.
- C. The water treatment chemical and service supplier must be a recognized specialist, active in the field of industrial water treatment for at least three (3) years, whose major business is in the field of water treatment, and who has full time service personnel within the trading area of the job site. Laboratory facilities must be available.
- D. Furnish and install all equipment and material on this project in accordance with the U.S. Environmental Protection Agency (EPA), and local Department of Environmental Protection, and so certified by the manufacturer.
- E. Analyze water from the local water company to be used on the project, before establishing treatment procedures.
- F. Provide a two-hour instruction course to the City of New York's operating personnel, instructing them clearly and fully on the installation, care, maintenance, testing and operation of the water treatment system. Arrange the instruction course at the start up of the system.



G. Treatment Standards

1. Closed Recirculating Water Systems:

System	Treatment and Chemical Conditions	Control Level
Hot Water, Glycol, Chilled Water and Closed Condenser Water 140°F maximum	Non-toxic organic corrosion and scale inhibitor	2000 ppm as total organic inhibitor
	Molybdate as Na <sub>2</sub> MoO <sub>4</sub> or Nitrite as NO <sub>2</sub>	200-300 ppm 500-700 ppm
	pH	7.0-9.0
Hot Water over 140°F	Nitrate as NO <sub>2</sub>	1500-2000 ppm
	pH	8.0-10.0

2. Open Systems:

System	Treatment and Chemical Conditions	Control Level
	ph	7.0 to 8.5
	Molybdate as Na <sub>2</sub> MoO <sub>4</sub>	5-10 ppm
	Cycles of concentration	10 maximum
	Organic growths	None



## **PART 2 - PRODUCTS**

### **2.1 PIPE CLEANING**

- A. Furnish all required pipe cleaning chemicals, chemical feed equipment, materials, and labor necessary to clean the piping as herein specified. In addition, permanently install necessary chemical injection fittings complete with stop valves and coupon racks, etc.
- B. Provide a pre-startup non-foaming, liquid detergent dispersant cleaner for cleaning of all systems to remove oil and foreign matter from the piping and equipment prior to the final filling of the systems. Use a chemical that is not injurious to persons, piping, pipe joint compounds, packings, coils, valves, pumps and their mechanical seals, tubes or other parts of the system.
- C. Furnish instructions dictating the quantities of the cleaner to use, methods and duration of the operation.

### **2.2 MANUFACTURERS**

- A. Water treatment program to be provided and maintained by:
  - 1. Tower Water Management
  - 2. Nalco
  - 3. Metropolitan Refining Co.
  - 4. Hayes-Trane, Mogul
  - 5. Tenco.
  - 6. Or approved equal

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Install all equipment, chemicals, water devices, etc. in accordance with water treatment specialist's directions and drawings, for all systems previously noted. Contractor will provide 1-inch taps to bring system water to desired locations. Minimum 2 on each main supply and return on closed loop systems. Minimum 4 on each main supply and return on open loop systems.
- B. pH adjustment, inhibitor and dispersant tanks shall be shipped in use containers. Pump suction assemblies previously specified will pump directly from these shipping drums.
- C. Installation and startup shall be supervised by factory representatives of the equipment manufacturer and chemical manufacturer.
- D. Shipping containers shall be disposed of or refilled off the premises at no additional cost.



- E. The Contractor shall coordinate with the facility on the existing chemical water treatment programs currently in place at the site. The addition of new / foreign chemical additives to existing hydronic HVAC Systems must be carefully coordinated with the requirements / restrictions specified by existing chemical water treatment program vendors and original HVAC equipment Manufacturers. Failure to provide proper coordination / implementation of cleaning chemical addition can result in physical injury and/or equipment damage. Contractor to confirm all requirements to integrate the pipe cleaning and treatment program proposed. Contractor to coordinate with the existing chemical water treatment program vendor at the site for coordination of work to be performed. With a validated chemical cleaning program established, Contractor to contact the original HVAC equipment Manufacturer's to review further restrictions of new / foreign chemical addition to prevent inadvertent equipment damage. Contractor to identify and perform all remedial work required to be performed if tested pipe pressure capacity and/or flow rate fails to meet specified performance level.

**3.2 WATER TREATMENT PROGRAM**

- A. Obtain an approved representative sample of the water supply and perform the following analyses:

<b>Analysis</b>	<b>Submittal Concentrations</b>
Sodium	ppm as Na
Silica	ppm as SiO <sub>2</sub>
Calcium	ppm as Ca
Magnesium	ppm as M <sub>n</sub>
Iron and aluminum oxides	ppm as Fe <sub>2</sub> O <sub>3</sub> AL <sub>3</sub> O
Bicarbonates	ppm ca CaCO <sub>3</sub>
Carbonates	ppm as CL
Phosphates	ppm as PO <sub>4</sub>
Carbon dioxide (free CO <sub>2</sub> )	ppm
Total hardness	ppm as CaCO <sub>3</sub>
Total dissolved solids	ppm
Suspended solids	ppm
Free acid	ppm as CaCO <sub>3</sub>

- B. Based on this analysis prepare and submit a water treatment program for approval.



### 3.3 PRELIMINARY CLEANING

- A. Clean new piping internally by flushing prior to the application of pressure tests, and before the chemical cleanout procedures specified herein. Provide temporary strainers at the inlet to the chilled water, condenser water, and hot water pumps before the start of cleaning procedures.
- B. Block off and isolate circulating pumps, cooling coils, heating coils, heat exchangers, and steam traps during the preliminary flushing and draining process.
- C. Provide temporary by-passes to fully circulate through all branch piping.

### 3.4 PIPE CLEANING

#### A. All Piping Systems

- 1. Provide temporary connections with valves to fill and drain the piping and equipment after completion of the chemical cleanout procedure. Provide temporary blind flanges and/or caps to isolate the piping and equipment.
- 2. Provide temporary piping connections, valves, strainers, bypasses, and blank connections where required to clean out systems.
- 3. After each hydrostatic leak testing procedure is complete, drain the system until empty. The piping systems are internally chemically treated and protected during the hydrostatic testing procedure as described in the Section entitled "Testing, Balancing and Adjusting". Thoroughly clean the piping and flush as follows:
  - a. Cleaning will not take place more than 14 days prior to startup. Give the chemical manufacturer's representative at least 30 days notice prior to startup.
  - b. Prior to the start of the chemical cleaning procedure submit three - two (2) foot lengths of the piping installed on this project to the chemical manufacturer for analysis of the interior coating on the piping. Refer to the Section entitled "Testing, Balancing and Adjusting" for additional requirements.
  - c. Add chemical pipe cleaning compound and corrosion inhibitor as recommended by the chemical manufacturer's representative to the system simultaneously with the filling of the system.
  - d. Circulate the cleaning compounds in the system for the time period specified by the chemical manufacturer.
  - e. Drain the system until empty from its lowest point.
  - f. Fill the system again with fresh water and flush thoroughly until clean water is obtained. (Maintain continuous blowdown and make-up as required during flushing operation). Use a one (1) micron cartridge type strainer element at end of drain hose to confirm that discharge water is free of foreign material.



- g. The cleaning and flushing procedure must be approved in writing by the chemical manufacturer. The chemical manufacturer's representative shall supervise and certify in writing the cleaning and flushing of the piping systems. The Contractor shall provide and install injection pumps, water meters, and coupon racks to control and monitor the cleaning process.

**B. Additional Requirements for Hot Water Heating System**

1. Fill system with City water; start circulation pump and vent high points manually until all air is released from the system.
2. Flush the system with fresh water, drain a second time and refill. After final filling, the pH of the water must not exceed the pH of the fresh incoming water by more than 0.5 pH.
3. Introduce the chemical cleaning solution into the system gradually by injecting into the suction side of the circulating pump, or by means of a bypass chemical feeder. Slowly raise and then maintain the temperature of the circulating hot water at 150°F by circulating through the hot water heat exchanger.
4. While the water is being heated and circulated open each drain connection for a short flow. Repeat at hourly intervals. Replace water drained during blowdown with chemical solution as required until air is eliminated from the system. The chemical cleanout procedure shall be continuous in this manner for two full 8-hour periods.
5. At the conclusion of the chemical cleanout period completely drain the entire system and allow to cool. Flush out with fresh City water prior to final activation of the system. Remove temporary equipment and strainers, reconnect permanent pump and replace items previously removed.

**3.5 FILLING OF WATER SYSTEMS**

- A. After completion of chemical cleanout, fill each water system with fresh water, air vent, and immediately add chemical treatment to passivate metal.
- B. Furnish the following chemicals as required for the system until the City of New York has issued a "certificate of substantial completion":
  1. pH Adjustment Chemicals: Provide suitable pH adjustment chemicals in 50 gallon drums to control pH at the 7.8-8.8 level.
  2. Corrosion Inhibitor: Provide non-polluting corrosion inhibitor
  3. Dispersant: Provide non-polluting dispersant
  4. Biocide: Provide both oxidizing and non-oxidizing biocide. Provide non-polluting biocide
  5. Recommend pH adjustment chemical, corrosion inhibitor, dispersant, and biocide for the local water characteristics.



### **3.6 GLYCOL SOLUTIONS**

- A. Clean systems with a 1% to 2% solution of trisodium phosphate in water prior to the installation of industrially inhibited glycol fluid.
- B. Clean extensively corroded systems using the services of an industrial cleaning company. Make all necessary replacements and repairs.
- C. Use only good quality water in solution with the glycol fluid. Use water with low levels (fewer than 25 ppm each) of chloride and sulfate; and fewer than 50 ppm each of hard water ions ( $Ca^{++}$ ,  $Mg^{++}$ ) with total hardness not to exceed 100 ppm. Distilled or deionized water is recommended. If good quality water is unavailable, purchase pre-diluted solutions of industrially inhibited glycol fluid from the fluid manufacturer.

**END OF SECTION 23 25 00**



**SECTION 23 26 00  
WATER SPECIALTIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide water specialties in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Air Vents.
- B. Air Separators.
- C. Relief Valves.
- D. Strainers.
- E. Suction Diffuser.
- F. Expansion Tanks.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings: Submit shop drawings prior to manufacture. Do not proceed with fabrication of equipment until fully approved shop drawings have been returned.
- C. Product Data: Submit manufacturer's latest published data indicating rating data, catalog cuts, model numbers, dimensional information, and pressure drops.



#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Comply with the applicable requirements of ASME, ANSI, U.L., ASTM and New York City Electric Code.

### **PART 2 - PRODUCTS**

#### **2.1 AIR VENTS**

- A. Provide air vents with 3/4" IPS inlet connection and 3/8" outlet, suitable for the system and for the system working pressure and temperature. Design vents to eliminate air from the system automatically without permitting the passage of water. Construct vents of brass body, copper float and stainless steel valve parts.
- B. Manufacturers
  - 1. Bell & Gossett
  - 2. Sarco
  - 3. Hoffman
  - 4. Amtrol
  - 5. Armstrong
  - 6. Or approved equal

#### **2.2 AIR SEPARATORS**

- A. In-Line Air Separator
  - 1. Furnish and install a horizontal in-line air separator designed to effectively separate free air in water systems. Construct the air separator of heavy duty cast iron designed to function satisfactorily at working pressures up to 175 PSI and liquid temperatures up to 300°F. Provide an integral weir designed to decelerate system flow to maximize air separation.
- B. Centrifugal Air Separator
  - 1. Furnish and install a centrifugal type air separator. Provide with inlet and outlet connections tangential to the vessel shell. Vessel shell diameter to be three times the nominal inlet/outlet pipe diameter.
  - 2. Provide an internal stainless steel air collector tube with 5/32" diameter perforations and 63% open area designed to direct accumulated air to an external air vent via an NPT connection at top of unit.



3. Construct the unit with a removable galvanized steel system strainer with 3/16" diameter perforations and a free area of not less than five times the cross-sectional area of the connecting pipe. Provide a blow down connection to facilitate routine cleaning of the strainer.
  4. Manufacturer to furnish data sheet specifying air collection efficiency and pressure drop at rated flow.
  5. Provide a Manufacturer's Data Report for Pressure Vessels, Form U-1 as required by the provisions of the ASME Boiler and Pressure Vessel Code for each air separator.
- C. Manufacturers
1. Bell & Gossett
  2. Amtrol
  3. Armstrong
  4. Or approved equal

### **2.3 RELIEF VALVES**

- A. Provide diaphragm operated safety relief valve, ASME labeled, for relieving pressure. Refer to Drawings for pressure rating of valve and relief setting. Discharge water to be through NPT connection.
- B. Provide valve with a low blow-down differential constructed of bronze or iron body. The valve seat and all moving parts exposed to fluid will be of non-ferrous material.
- C. Manufacturers
1. Bell & Gossett
  2. Amtrol
  3. Armstrong
  4. McDonnell & Miller
  5. Kunkle
  6. Or approved equal



## 2.4 STRAINERS

- A. Provide "Y" pattern iron body water strainers for the pressure ratings as described herein. Strainers to be self-cleaning with screen free area a minimum of three times the inlet pipe area. Provide strainer basket cleanout cap with tapping to permit connecting of blow-down valve.
- B. The following types are provided to establish a minimum standard:
1. 150 psig up to 2" - "Y" pattern type with 20 mesh stainless steel screen with screw ends.
  2. 150 psig 2½" to 12" - "Y" pattern type with .125" perforations, stainless steel screen, flanged ends.
  3. 300 psig up to 2" - "Y" pattern type with 20 mesh stainless steel screen with screw ends.
  4. 300 psig 2½" to 12" - "Y" pattern type with .125" perforations, stainless steel screen, flanged ends.
  5. 14" to 20" – Basket type with .125" perforations, stainless steel screen, flanged ends to match pressure of system.
- C. Manufacturers
1. Sarco
  2. Hoffman
  3. Crane
  4. Zurn
  5. Mueller
  6. Armstrong
  7. Or commissioner approved equal

## 2.5 SUCTION DIFFUSER

- A. Provide suction diffusers to consist of angle type body with straightening vanes and combination diffuser-strainer-orifice cylinder with 3/16" diameter openings. Provide a permanent magnet located within the flow stream and removable for cleaning. Equip the orifice cylinder with a start-up disposable fine mesh strainer. Design orifice cylinder to withstand pressure differential equal to pump shutoff head and a free area equal to five times cross section area of pump suction opening. Straightening vanes shall extend the full length of the orifice cylinder and be replaceable. Provide unit with adjustable support foot to carry weight of suction piping.



- B. Manufacturers
  - 1. Bell & Gossett
  - 2. Armstrong
  - 3. Keckley
  - 4. Or approved equal

## 2.6 EXPANSION TANKS

- A. Furnish and install a diaphragm type hydro-pneumatic expansion tank especially designed for use on the services specified. Construct the compression tank of welded steel and equip with a butyl flexible diaphragm to maintain a separation between the system water and the air cushion. Provide with bottom inlet connection for all water systems. Each tank shall bear an appropriate ASME label for the following minimum working pressures and temperatures:
  - 1. Building Chilled Water: 125 psig - 100°F.
  - 2. Building Closed Condenser Water System: 125 psig - 100°F.
  - 3. Building Hot Water: 125 psig - 200°F.
- B. The minimum total tank volume and acceptable volume to be as specified on the Drawings. Provide a factory initial charge of 15 psig.
- C. Provide suitable structural support as required for each tank as indicated on the Drawings.
- D. Provide for each tank, lifting lugs, base ring, drains, N<sub>2</sub> charging connections, piping connections, and specialties as required and indicated on the Drawings. Provide one (1) bottle of N<sub>2</sub> and manifold to be used to charge all tanks. Each tank shall have an ASME relief valve set at the appropriate pressure.
- E. Provide a U.L. listed mercoid Series DA31-153-7, Honeywell, Ebtron or approved equal pressure switch operated by a brass bourdon tube activating a mercury switch. This switch to activate a low-pressure alarm as indicated in the Controls Specification.
- F. Paint the outside of the tank with a shop coat of approved rust inhibiting primer after fabrication.
- G. Manufacturers
  - 1. Bell & Gossett
  - 2. Amtrol
  - 3. Taco
  - 4. Or approved equal



## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Provide automatic air vents at high points of all piping and as required for removal of air from the system using 3/4" steel pipe suitable for the pressure service between the main pipe and inlet. Provide 3/8" OD hard drawn Type L copper tubing from vent outlet for overflow in case of defective action. Copper tubing shall run into a suitable drain. When vents are located above hung ceilings, connect all vent drains to a common drain main and pipe to nearest slop sink or floor drain. Provide 3/4" stop valve in the inlet line for servicing of automatic air vent. Manual vents may be substituted for automatic vents, at system high points, only as directed by the Commissioner.
- B. Provide at each heat transfer element supplied with water, not less than one 1/2" manual air vent. Furnish ten (10) keys.
- C. Provide manual air vent valves in the piping connections to each hot water heating coil and each chilled water coil (both supply and return where such are not automatically vented). Provide a 1/4" vent line from each air vent to nearest floor drain, or as directed, to suit job conditions. At Commissioner's discretion, provide soft temper copper tube pigtail on manual vents, in lieu of 1/4" vent line, so that vent can be discharged into a bucket.
- D. Install relief valves in upright position with discharge piped to nearest floor drain.

### **3.2 STRAINER INSTALLATION**

- A. On open systems, install strainers immediately upstream of each automatic control valve with the same size as the inlet pipe indicated on the drawings, not reduced size serving the control valve.
- B. Provide approved valved dirt blowout extensions on each strainer. Locate each blowout valve at hand-height.
- C. Clean the strainers as necessary until accepted by the commissioner
- D. Provide temporary strainer in the suction line of each pump during construction, testing and balancing. Replace with permanent strainers after acceptance by the commissioner.
- E. Minimum strainer body at pump inlet connections: 3 inch.
- F. Prior to installation, disassemble strainer, coat with non-seizing type lubricant and reassemble.
- G. Install strainers with ample space for basket removal. Where shown on the Drawings, provide quick opening 1" blow-off valve with hose bibb end.
- H. Install suction diffusers on pump inlets with ample space for basket removal. Where pumps are mounted on inertia pads, suction diffuser will be supported with steel pipe section on inertia pad. All other installations, the suction diffuser will be supported by steel pipe section and a neoprene pad 1" thick. Remove start-up strainer after start-up and pipe cleaning has been accepted by Commissioner.

**END OF SECTION 23 26 00**



**SECTION 23 33 13  
DAMPERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Combination Fire/Smoke Dampers.
- B. Volume Dampers.
- C. Splitter Dampers.
- D. Backdraft Dampers.
- E. Automatic Damper Installation.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit complete manufacturers data on all dampers required by this section, including sizes, location, quantity, and construction details.
- C. Submit samples of dampers as requested by the Commissioner.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Fabrication testing and installation to be in compliance with U.L. and NFPA. Fire dampers to be U.L. labeled for 1½ or 3 hour rating as indicated on the Drawings. Refer to architectural drawings for fire ratings of slabs and partitions being penetrated.



- C. Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Details and details as shown on the Drawings.

## **1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.

## **PART 2 - PRODUCTS**

### **2.1 COMBINATION FIRE/SMOKE DAMPERS**

- A. Provide combination fire/smoke dampers as shown on the Drawings in ducts piercing fire rated walls and floors, and where shown on the Drawings.
- B. Provide normally closed dampers that are electrically operated. Provide factory-mounted U.L. approved actuators, relays and damper position switches.
- C. Dampers to be of opposed multi-blade construction and classified in accordance with U.L. Standard 555 and 555S in all respects including size limitations. Use Class 1 dampers, with maximum leakage of 4 cfm/sq.ft., in ducts with velocities at or over 2000 FPM, and Class 2 dampers, with maximum leakage of 10 cfm/sq.ft., in ducts with velocities under 2000 FPM, unless noted otherwise on the Drawings. Minimum size Class 1 damper, 12 x 12. Minimum size Class 2 damper, 9 x 9.
- D. Damper construction to be minimum 16 gauge galvanized steel frame and blades. Side seal to be Type 304 flexible stainless steel with bronze or stainless steel shaft bearings in end plate. Damper linkage to be outside air stream.
- E. Provide dampers designated as "FSD-FL" with a fusible link which will close and lock damper on increased air temperature over 165°F 212°F.
- F. Provide dampers designated as "FSD" and "FSD-3" with an electrically resettable link which will close and lock damper on increased air temperature over 165°F. The link to be manually resettable at the damper linkage without need of link replacement. Provide damper position indicator external of damper.
- G. Provide dampers designated as "FSD-HS" and "FSD-HS3" as normally closed and provided with a means of automatically opening dampers remotely from the Fire Command Center when the air temperature is below the damper linkage degradation temperature of 250°F 350°F. This will be accomplished by
  - 1. a thermal link which will disengage the damper actuator at or above the degradation temperature of the damper. The release of the link will cause the damper to close and lock until the link has cooled to



below the degradation temperature. Activation of the actuator will re-engage the damper linkage in this situation.

OR

2. a dual heat sensor, one set at 160°F and one set at degradation temperature. The first sensor will be bypassed on temperatures below the degradation temperature, on a signal from the Fire Command Center. The second sensor will be in series with this signal and prevent damper opening if temperatures exceed the damper degradation temperature. Provide dampers with position indicator switches to provide remote status of open or closed positions.
- H. Provide dampers designated as "FSD-RA" as normally open and provided with a means of maintaining damper closed during "normal" situations. Provide means to automatically open dampers remotely from the fire command center, or as described in the controls specification.
- I. Manufacturers
1. Ruskin
    - a. Model FSD35 (Class 2)
    - b. Model FSD60 (Class 1)
    - c. Model FSD31 (3 hour)
  2. Imperial
    - a. Model 770 (FSD Class 2 only)
    - b. Model 710 (FSD-HS or FSD Class 2 only)
  3. Nailor-Hart
  4. Air Balance
  5. Arlan
  6. Or approved equal

## **2.2 VOLUME DAMPERS**

- A. Provide volume dampers as shown on the Drawings and as required for proper balancing and distribution of air, in the various branches of the ductwork for use in balancing the system. Dampers to be installed separately and independently of the registers hereinafter specified to be set behind supply, return and exhaust air grilles. Provide multi-blade dampers in ducts above 24 inches in width or 16 inches in height. Coordinate with the air balancing subtrade specialist and provide all additional dampers required for proper air balance.
- B. Provide volume dampers of the quadrant type, of heavy construction, pivoted to turn easily and provided with approved operating and locking devices mounted on outside of the duct in an accessible place.



- C. For all volume dampers located above inaccessible ceilings, provide remote cable operators. Anemostat type OB-ASL complete with fastening device and hex key operator.

### **2.3 SPLITTER DAMPERS**

- A. Provide SMACNA Standard splitter dampers for ductwork smaller than 28 inches in width. Operators for dampers above plaster or drywall ceilings to be Young Regulator Co. No. 895, Ruskin, or Pottorff with No. 1200 gear operator or approved equal.

### **2.4 BACKDRAFT DAMPERS**

- A. Provide balanced, tight closure, 1/8-inch thick aluminum backdraft dampers of the self-operating type where indicated on the Drawings. Fabricate damper frames from extruded aluminum with mitered corners. Blades to be extruded aluminum with extruded vinyl edge seals. Blade/frame assembly to be weather resistant with blades overlapping the frame. Damper bearings to be bronze oilite nylon or cyclohex. Provide bird screen over opening.

#### **B. Manufacturers**

1. Ruskin
2. Prefco
3. Potorff
4. Or approved equal

### **2.5 AUTOMATIC DAMPER**

- A. Install all automatic dampers.

## **PART 3 - EXECUTION**

### **3.1 FIRE DAMPERS AND FIRE/SMOKE DAMPERS**

- A. Provide conveniently located access doors, of ample size for resetting the dampers. Duct mounted grilles, registers or diffusers can be used for access as long as such access is readily available as determined by the Commissioner.
- B. Galvanize or paint with one coat of rust inhibiting paint the entire fire damper assembly before installation.
- C. In the open position with damper shutter stored, provide 95 percent free area.
- D. All actuators of automatic fire dampers (FD-H) and combination fire/smoke dampers (FSD) are connected by the Contractor to the controlling device. The Contractor will provide all wiring, conduit pneumatic tubing, circuit protective devices, etc., as necessary to meet this requirement.



- E. Fire/smoke dampers designated as FSD-HS will be installed in ducts and penetrations of rated walls and floors which are part of a smoke control and/or evacuation system. These dampers may be controlled during normal operation by the A.T.C. BMS system; however, during a smoke or fire emergency, these dampers will be openable from the Fire Command Center.
- F. Design dampers incorporating multiple sections in such a way that the actuators are readily accessible. Coordinate locations so as not to be necessary to remove damper sections, structural, or other fixtures, to facilitate removal of damper motors. Provide access doors where necessary to meet this requirement. In particular, ensure that where in-air stream actuators are provided, they are readily accessible.
- G. Do not install Class 1 fire/smoke or smoke dampers in ducts with any dimension smaller than 12". Expand duct to 12" prior to installation. For Class 2 dampers, the minimum dimension is 9".

### **3.2 ALL DAMPERS**

- A. Mount dampers plumb and level. Provide additional duct bracing and supports to properly support dampers.
- B. Provide duct access doors for internal access to all fire dampers, combination fire/smoke dampers, smoke dampers, automatic dampers, and backdraft dampers.
- C. Damper construction to be similar to that of the ductwork to which it connects (i.e., galvanized to galvanized, stainless steel to stainless steel).
- D. Provide on all dampers, extractors, etc. mounted on externally insulated ductwork, 16 gauge elevated platform at least 1/8" higher than the thickness of the insulation. Provide damper shaft with a shaft bearing mounted on ductwork within elevated platform.

**END OF SECTION 23 33 13**



**Department of  
Design and  
Construction**

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**SECTION 23 33 20  
DUCT CLEANING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 QUALIFICATION OF THE HVAC SYSTEM CLEANING SUBCONTRACTOR**

- A. Experience: The HVAC system cleaning subcontractor shall have (3) three years of experience.
- B. Equipment, Materials and Labor: The HVAC system cleaning subcontractor shall possess and furnish all necessary equipment, materials and labor to adequately perform the specified services.
1. The contractor shall assure that its employees have received safety equipment training, medical surveillance programs, individual health protection measures, and manufacturer's product and material safety data sheets (MSDS) as required for the work by the U.S. Occupational Safety and Health Administration, and as described by this specification.
  2. The contractor shall maintain a copy of all current MSDS documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of applicable OSHA programs and this specification
  3. Contractor shall submit to the commissioner all Material Safety Data Sheets (MSDS) for all chemical products proposed to be used in the cleaning This General Specification describes the minimum requirements necessary for commercial HVAC system cleaning.
- C. Licensing: The HVAC system cleaning subcontractor shall provide proof of maintaining the proper license(s), if any, as required to do work in this state. Contractor shall comply with all licensing requirements.



### **1.3 STANDARDS**

- A. NADCA Standards: The HVAC system cleaning subcontractor shall perform the services specified here in accordance with the current published standards of the National Air Duct Cleaners Association (NADCA).
  - 1. All terms in this specification shall have their meaning defined as stated in the NADCA Standards.
  - 2. NADCA Standards must be followed with no modifications or deviations being allowed.

### **1.4 DOCUMENTS**

- A. Mechanical Drawings: The commissioner shall provide the HVAC system cleaning subcontractor with one copy of the following documents:
  - 1. Project drawings and specifications.
  - 2. Approved construction revisions pertaining to the HVAC system.
  - 3. Any existing indoor air quality (IAQ) assessments or environmental reports prepared for the facility.

### **1.5 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

### **1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

## **PART 2 - PRODUCTS**

### **2.1 SCOPE OF WORK**

- A. Scope: This section defines the minimum requirements necessary to render HVAC components clean, and to verify the cleanliness through inspection and/or testing in accordance with items specified herein and applicable NADCA Standards.
- B. The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HVAC system in strict accordance with these specifications.
- C. The HVAC system includes any interior surface of the facility's air distribution system for conditioned spaces and/or occupied zones. This includes the entire heating, air-conditioning and ventilation system from the points where the air enters the system to the points where the air is discharged from the system. The return air grilles, return air ducts to the air handling unit (AHU), the interior surfaces of the AHU, mixing box, coil compartment, condensate drain pans, humidifiers and dehumidifiers, supply air ducts, fans, fan housing, fan blades, air wash systems, spray eliminators, turning vanes, filters, filter housings, reheat coils, and supply diffusers are all considered part of the HVAC system. The HVAC system may also include other components such as dedicated exhaust and ventilation components and make-up air systems.

## **2.2 HVAC SYSTEM COMPONENT INSPECTIONS AND SITE PREPARATIONS**

- A. HVAC System Component Inspections: Prior to the commencement of any cleaning work, the HVAC system cleaning subcontractor shall perform a visual inspection of the HVAC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. The cleanliness inspection should include air handling units and representative areas of the HVAC system components and ductwork. In HVAC systems that include multiple air handling units, a representative sample of the units should be inspected.
- B. The cleanliness inspection shall be conducted without negatively impacting the indoor environment through excessive disruption of settled dust, microbial amplification or other debris. In cases where contamination is suspected, and/or in sensitive environments where even small amounts of contaminant may be of concern, environmental engineering control measures should be implemented
  - 1. Damaged system components found during the inspection shall be documented and brought to the attention of the commissioner.
- C. Site Evaluation and Preparations: Contractor shall conduct a site evaluation, and establish a specific, coordinated plan which details how each area of the building will be protected during the various phases of the project.
- D. Inspector Qualifications: Qualified personnel should perform the HVAC cleanliness inspection to determine the need for cleaning. At minimum, such personnel should have an understanding of HVAC system design, and experience in utilizing accepted indoor environmental sampling practices, current industry HVAC cleaning procedures, and applicable industry standards.

## **2.3 GENERAL HVAC SYSTEM CLEANING REQUIREMENTS**

- A. This General Specification describes the minimum requirements necessary for commercial HVAC system cleaning.
- B. Containment: Debris removed during cleaning shall be collected and precautions must be taken to ensure that Debris is not otherwise dispersed outside the HVAC system during the cleaning process.
- C. Particulate Collection: Where the Particulate Collection Equipment is exhausting inside the building, HEPA filtration with 99.97% collection efficiency for 0.3-micron size (or greater) particles shall be used. When the Particulate Collection Equipment is exhausting outside the building, Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain Debris removed from the HVAC system. When the Particulate Collection Equipment is exhausting outside the building, precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the building.
- D. Controlling Odors: Measures shall be employed to control odors and/or mist vapors during the cleaning process.



- E. **Component Cleaning:** Cleaning methods shall be employed such that all HVAC system components must be Visibly Clean as defined in applicable standards (see NADCA Standards). Upon completion, all components must be returned to those settings recorded just prior to cleaning operations.
- F. **Air-Volume Control Devices:** Dampers and any air-directional mechanical devices inside the HVAC system must have their position marked prior to cleaning and, upon completion, must be restored to their marked position.
- G. **Service Openings:** The contractor shall utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection.
  - 1. Contractor shall utilize the existing service openings already installed in the HVAC system where possible.
  - 2. Other openings shall be created where needed and they must be created so they can be sealed in accordance with New York City Mechanical Code.
  - 3. Closures must not significantly hinder, restrict, or alter the airflow within the system.
  - 4. Closures must be properly insulated to prevent heat loss/gain or condensation on surfaces within the system.
  - 5. Openings must not compromise the structural integrity of the system.
  - 6. Construction techniques used in the creation of openings conform to requirements of New York City building and fire codes, and applicable NFPA, SMACNA and NADCA Standards.
  - 7. Cutting service openings into flexible duct is not permitted. Flexible duct shall be disconnected at the ends as needed for proper cleaning and inspection.
  - 8. Rigid fiber glass duct systems shall be resealed in accordance with NAIMA recommended practices. Only closure techniques that comply with UL Standard 181 or UL Standard 181a are suitable for fiber glass duct system closures.
  - 9. All service openings capable of being re-opened for future inspection or remediation shall be clearly marked and shall have their location reported to the commissioner in project report documents.
- H. **Ceiling sections (tile):** The contractor may remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process.
- I. **Air distribution devices (registers, grilles & diffusers):** The contractor shall clean all air distribution devices.



- J. Air handling units, terminal units (VAV, Dual duct boxes, etc.), blowers and exhaust fans: The contractor shall insure that supply, return, and exhaust fans and blowers are thoroughly cleaned. Areas to be cleaned include blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades, or vanes, shafts, baffles, dampers and drive assemblies. All visible surface contamination deposits shall be removed in accordance with NADCA Standards. Contractor shall:
1. Clean all air handling units (AHU) internal surfaces, components and condensate collectors and drains.
  2. Assure that a suitable operative drainage system is in place prior to beginning wash down procedures.
  3. Clean all coils and related components, including evaporator fins.
- K. Duct Systems. Contractor shall:
1. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
  2. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing Cleaning Verification Tests (see NADCA Standards).

## **2.4 HEALTH AND SAFETY**

- A. Safety Standards: Cleaning contractors shall comply with applicable standards of the Occupational Safety and Health Administration (OSHA) and shall be followed when working in accordance with this specification.
- B. Occupant Safety: No processes or materials shall be employed in such a manner that they will introduce additional hazards into occupied spaces.
- C. Disposal of Debris: All Debris removed from the HVAC System shall be disposed of.

## **2.5 MECHANICAL CLEANING METHODOLOGY**

- A. Source Removal Cleaning Methods: The HVAC system shall be cleaned using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. It is the contractor's responsibility to select Source Removal methods that will render the HVAC system Visibly Clean and capable of passing cleaning verification methods (See applicable NADCA Standards) and other specified tests, in accordance with all general requirements. No cleaning method, or combination of methods, shall be used which could potentially damage components of the HVAC system or negatively alter the integrity of the system.
1. All methods used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment are assured.
  2. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.



3. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate New York City Building, Energy, Fire and Mechanical Codes.
4. All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods will include those, which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

**B. Methods of Cleaning Fibrous Glass Insulated Components**

1. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.
2. Cleaning methods used shall not cause damage to fibrous glass components and will render the system capable of passing Cleaning Verification Tests (see NADCA Standards).

**C. Damaged Fibrous Glass Material**

1. Evidence of damage: If there is any evidence of damage, deterioration, delaminating, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating, they shall be identified for replacement.
2. Replacement: When requested or specified, Contractor must be capable of remediating exposed damaged insulation in air handlers and/or ductwork requiring replacement.
3. Replacement material: In the event fiber glass materials must be replaced, all materials shall conform to New York City Mechanical Code, including those of UL and SMACNA.

**D. Cleaning of coils**

1. Any cleaning method may be used which will render the Coil Visibly Clean and capable of passing Coil Cleaning Verification (see applicable NADCA Standards). Coil drain pans shall be subject to Non-Porous Surfaces Cleaning Verification. The drain for the condensate drain pan shall be operational. Cleaning methods shall not cause any appreciable damage to, displacement of, inhibit heat transfer, or erosion of the coil surface or fins, and shall conform to coil manufacturer recommendations when available. Coils shall be thoroughly rinsed with clean water to remove any latent residues.

**E. Antimicrobial Agents and Coatings**

1. Antimicrobial agents shall only be applied if active fungal growth is reasonably suspected, or where unacceptable levels of fungal contamination have been verified through testing.



2. Application of any antimicrobial agents used to control the growth of fungal or bacteriological contaminants shall be performed after the removal of surface deposits and debris.
3. When used, antimicrobial treatments and coatings shall be applied in strict accordance with the manufacturer's written recommendations and EPA registration listing.
4. Antimicrobial coatings shall be applied according to the manufacturer's written instructions. Coatings shall be sprayed directly onto interior ductwork surfaces, rather than "fogged" downstream onto surfaces.

## **2.6 CLEANLINESS VERIFICATION**

- A. General: Verification of HVAC System cleanliness will be determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system, including biocidal agents and coatings.
- B. Visual Inspection: The HVAC system shall be inspected visually to ensure that no visible contaminants are present.
  1. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean; however, the commissioner reserves the right to further verify system cleanliness through Surface Comparison Testing or the NADCA vacuum test specified in the NADCA standards.
  2. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
  3. NADCA vacuum test analysis should be performed by the contractor.
- C. Verification of Coil Cleaning
  1. Cleaning must restore the coil pressure drop to within 10 percent of the pressure drop measured when the coil was first installed. If the original pressure drop is not known, the coil will be considered clean only if the coil is free of foreign matter and chemical residue, based on a thorough visual inspection (see NADCA Standards).

## **2.7 PRE-EXISTING SYSTEM DAMAGE**

- A. Contractor is not responsible for problems resulting from prior inappropriate or careless cleaning techniques of others.

## **2.8 POST-PROJECT REPORT**

- A. At the conclusion of the project, the Contractor shall provide a report to the commissioner indicating the following:
  1. Success of the cleaning project, as verified through visual inspection and/or gravimetric analysis.
  2. Areas of the system found to be damaged and/or in need of repair.



- 2.9** Applicable Standards and Publications: The following current standards and publications of the issues currently in effect form a part of this specification to the extent indicated by any reference thereto:
- A. National Air Duct Cleaners Association (NADCA): "Assessment, Cleaning & Restoration of HVAC Systems (ACR 2005)," 2004.
  - B. National Air Duct Cleaners Association (NADCA): "Understanding Microbial Contamination in HVAC Systems," 1996.
  - C. National Air Duct Cleaners Association (NADCA): "Introduction to HVAC System Cleaning Services," 2004.
  - D. National Air Duct Cleaners Association (NADCA): Standard 05 "Requirements for the Installation of Service Openings in HVAC Systems," 2004.
  - E. Underwriters' Laboratories (UL): UL Standard 181.
  - F. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
  - G. Environmental Protection Agency (EPA): "Building Air Quality," December 1991.
  - H. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible."
  - I. (North American Insulation Manufacturers Association (NAIMA): "Cleaning Fibrous Glass Insulated Air Duct Systems."

**PART 3 - EXECUTION**

- A. Not Used

**END OF SECTION 23 33 20**



**SECTION 23 36 10  
AIR OUTLETS AND INLETS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
  
- B. Furnish and install all air devices, diffusers, grilles, registers, and ceiling outlets as indicated on the Drawings and as required for the ceiling type and proper distribution of air within the space and for return of air from the space to the various air systems. Exhaust grilles and registers shall also be provided where indicated on the Drawings.

**1.2 WORK INCLUDED**

- A. Air Outlets.
- B. Air Inlets.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's data indicating air distribution, outlet velocities, and acoustic performance.
- C. Submit manufacturer's specifications of construction including materials, installation instruction and adjustment data. Include "K" factors for balancing.
- D. Submit product accessories.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Air outlets and inlets to be tested in accordance with ADC (Air Diffusion Council).



## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Size the air distribution outlets as shown on the drawings to accommodate the air volume and throw indicated so as to maintain a maximum terminal velocity of 50 feet per minute in the occupied area. The overall noise level produced by all of the supply air outlets and return air inlets in various rooms are not to exceed specified limits. Air devices shall be placed to distribute in such a manner that the space temperature will not vary more than 2°F over the entire conditioned area. The conditioned area is defined as the area 2'-0" above the floor to 7'-0" above the floor, inclusive. If the Contractor cannot comply with the above requirements by following the arrangement shown on the Drawings, he is to notify the Commissioner, in writing, setting forth requested modifications.
- B. At the discretion of the Commissioner, air outlets may be smoke tested to determine their compliance with these Specifications. See the Section entitled "Testing, Balancing and Adjusting" for testing requirements. At no cost to the City of New York make any revisions required for compliance with terminal velocity requirements, noise level requirements.
- C. Refer to Architectural Drawings and Specifications for ceiling type and construction. Provide proper frames and borders to fit the ceiling specified.

### **2.2 OUTLET TYPES**

- A. Square Ceiling Diffuser Perforated Face
  - 1. Perforated face star pattern supply diffuser, steel construction with removable/stationary deflectors. Deflectors to provide horizontal air pattern towards the corners of the diffuser. Sizes indicated on the Equipment Schedule are neck sizes. Face area is approximately 24" x 24". Air pattern is as indicated on the Drawings. Baked enamel finish and black inner finish.
- B. Square Diffuser
  - 1. Same as CD-A, except face area is approximately 12" x 12".
- C. Square Ceiling Diffuser Louver Face Fixed Pattern
  - 1. Louver face supply diffuser, all steel construction. Sizes indicated on Equipment Schedule are neck sizes. Baked enamel finish. Face area is approximately 24" x 24".
- D. Square Ceiling Diffuser Louver Face Fixed Pattern
  - 1. Same as CD-C except face area is approximately 12" x 12".
- E. Round Ceiling Diffuser
  - 1. Round face diffuser with fixed cone positions, all steel construction. Sizes indicated on Equipment Schedule are neck sizes. Baked enamel finish.



F. Exposed Duct Supply Register

1. Steel register with front vertical and rear horizontal adjustable air foil type blades on 0.75" centers and steel opposed blade volume control damper. Baked enamel finish. Install register on a reverse knuckle joint in accordance with SMACNA Manual.

G. Sidewall Supply Register

1. All aluminum register with front vertical and rear horizontal adjustable air foil type blades on 0.75" centers and aluminum opposed blade volume control damper. Baked enamel finish.

H. Sidewall Stair Pressurization Register

1. Extruded aluminum register with horizontal fixed blades (no vertical adjustable rear blades), aluminum opposed blade volume control damper, gasketed frame with concealed screw fastening. Baked enamel finish.

I. Linear Supply Diffuser Bar Type

1. Extruded aluminum linear diffuser for ceiling or sidewall application with 15° deflection, ½" bar spacing, 1" border, concealed fastening. Provide diffuser length, width, and air volume as indicated on the Drawings. Clear anodized finish.

J. Linear Supply Diffuser Louver Type

1. Extruded aluminum linear diffuser for ceiling or sidewall applications. Border size, length and width as indicated on Drawings. Clear anodized finish.

K. Linear Supply Diffuser Slot Type

1. Extruded aluminum with steel pattern controllers. 3/4" slot with concealed fastening. Number of slots, lengths and air volume as indicated on the Drawings. Clear anodized finish.

L. Perimeter Ceiling Combination Supply/Return Slot Diffuser

1. Maximum 7" high side inlet slot type diffuser (with 2" wide return section in the top of the return section of the unit unless noted otherwise on the Drawings). For 6" and 8" inlets provide oval connection. Provide length and nominal diffuser width as indicated on the Drawings. Provide inlet connection at least 2½" long with a 1/8" high raised bead located 1" from the inlet connection. Provide internal fixed curved aerodynamic shaped extruded aluminum design to provide the maximum amount of induced secondary room air. Construct aerodynamic supply deflection of extruded aluminum held in position by set screws at both ends of the diffuser. No spot welding visible from the face when installed will be accepted. The design will discharge supply air horizontally along the ceiling toward the interior and vertically. Design, test and construct the diffuser in a manner so as to comply with the performance and sound level requirements specified on the Drawings. Construct the integral return air section as indicated on the Drawings. Plenum is constructed of a least 24 gauge galvanized steel, with no exposed insulation sections, and will be substantially supported and reinforced as required. Provide the air



volume, length, and duct connection size as indicated on the Drawings. The outlet manufacturer will coordinate the attachment, support, etc., of the supply plenum with the Ceiling Subcontractor. Test the entire assembly as a unit at the outlet manufacturer's laboratory in accordance with ADC test requirements and ADC tolerances. This test may be witnessed by the Commissioner. Submit six (6) certified copies of the ADC test results to the Commissioner for review. Include in the test data AK factors for an Anor velometer, sound data, diffuser static pressure drop, horizontal air throw and drop for the air supply rates per lineal foot of diffusers scheduled on the Drawings. Base the test data on a 51°F cooling air supply temperature and a 24°F temperature differential. The unit tests are not required if previous tests were done and acceptable test data is available in the Commissioner's file. Paint the plenum flat black on interior surfaces and on the exposed surfaces viewed from below the ceiling system.

2. Provide a 15" wide, 1" opening, center downblow section for 60" long diffusers a 15" wide, 1" opening, center downblow section for 48" long diffusers, a 12" wide, 1" opening, center downblow section for 36" long diffusers, and an 8" wide, 1" opening, center downblow section for 24" long diffusers.

**M. Combination Plenum and Linear Slot**

1. Provide plenum with linear slot diffuser. Plenum to be insulated steel construction. Length, number of slots and air volume to be as shown on Drawings. Unit to include plenum, slot diffuser and pattern controller. Test complete assembly as a unit at the outlet manufacturer's laboratory which may be witnessed by the Commissioner. Submit certified copies of the ADC test and air leakage test results to the Commissioner for review. Base test data on a 51°F supply air temperature and 24°F temperature differential. The maximum air leakage of the assembly is not to exceed 5% of the air volume indicated on the Drawings.

**2.3 INLET TYPES**

**A. Louvered Register**

1. For sidewall or ceiling return or exhaust. All aluminum construction with one set of horizontal fixed blades, set at 45° fixed deflection, 3/4" spacing. Provide a steel opposed blade damper. Baked enamel finish.

**B. Sidewall Perforated Register**

1. All aluminum construction with a steel opposed blade damper. Holes to be 3/16" diameter staggered. Baked enamel finish.

**C. Ceiling Perforated Register**

1. All steel construction. Face area as shown on Drawings. Provide steel opposed blade damper.

**D. Louvered Return Grille**

1. Same as ER-A except damper is deleted. For ceiling and sidewall applications.



- E. Sidewall Perforated Return Grille
  - 1. Same as ER-B except damper is deleted. For sidewall applications.
- F. Ceiling Perforated Grille
  - 1. Same as ER-C except damper is deleted. For ceiling applications.
- G. Door Mounted Transfer Grille
  - 1. All steel construction. Blades to be inverted "V" shaped, 20 gauge steel, to provide sight proof design and stiffness.
- H. Filter Return Grille
  - 1. Eggcrate design with ½" x ½" x ½" aluminum grid. Removable core to be hinged with concealed screws. Provide 1" fiberglass filter cut to size. Baked enamel finish.

#### **2.4 MANUFACTURERS**

- A. Titus
- B. Price
- C. Anemostat
- D. Krueger
- E. Tuttle & Bailey
- F. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 NOT USED.**

**END OF SECTION 23 36 10**



**Department of  
Design and  
Construction**

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**SECTION 23 51 00  
VENTS, STACKS AND BREECHING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide vents, stacks and breeching in accordance with the contract documents.

**1.2 WORK INCLUDED**

- A. Gas Vent – Type ‘B’
- B. Insulated Chimney Stack.
- C. Breeching.
- D. Boiler Gas Train Vent

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures” for all submittals.
- B. Submit manufacturers’ data and calculations on materials, draft calculations, pressure drops and installation recommendations. Calculations and layout shall be submitted in same package.
- C. Submit drawings indicating assembly and support of all sections.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. All vents, stacks and breeching to be U.L. listed.



## **PART 2 - PRODUCTS**

### **2.1 GAS VENT – TYPE ‘B’**

- A. Provide Type ‘B’ gas vents of double wall construction with outer shell of G90 galvanized steel minimum .018” and aluminum inner liner minimum .012”.
- B. Air space between inner and outer liner to be minimum ¼” on sizes up to 8” diameter, ½” on 10” to 16” and 1” over 16”.
- C. Joining of sections shall be twist lock up to 16” diameter and secured with sheetmetal screws on sizes over 16”.

### **2.2 INSULATED CHIMNEY STACK**

- A. Provide insulated chimney stack of double wall construction with 1” insulation.
- B. All chimney sections except floor supports, shall be cast in (26 gauge aluminized steel jackets with riveted seams). The calcium aluminate cement bonded insulating refractory shall be capable of withstanding up to 1800°F continuous firing with intermittent firing to 2000°F.
- C. All chimney sections shall be joined with silicone sealant supplied by the manufacturer. Acid resistant joint cement shall be used for flue gas temperatures over 600°F.

### **2.3 BREECHING**

- A. Provide a factory-built refractory lined breeching as from the appliances to the chimney.
- B. The breeching manufacturer shall furnish all items which form a part of the assembly, including tee sections, straight section, sections with access and cleanout doors, increasers, elbows and sampling ports as indicated on drawings.
- C. All breeching sections shall be cast on 11 gauge galvanized steel jacket with welded seams. Expansion joints shall be provided as required by the manufacturer utilizing the male and female expansion joint provided by the manufacturer. All section joints other than expansion joints shall be joined with silicone sealant supplied by the manufacturer and welded with a continuous weld. Acid resistant joint cement shall be used for flue gas temperature above 600F. The insulating refractory shall be capable of withstanding temperatures associated with Medium Heat Chimneys.
- D. The breeching shall be supported with hanger bands provided by the manufacturer and installed in accordance with the manufacturer’s recommendations.

### **2.4 BOILER GAS TRAIN VENT**

- A. Provide vent lines for all gas boiler train assembly.
- B. Vent lines to be scheduled 40 steel pipe and routed to the outside.



- C. Vent line to be 1" minimum or larger, if required, per the gas train. Contractor to include routing of vent lines on pipe shop drawing for review and approval.

## **2.5 MANUFACTURERS**

- A. Metalbestos
- B. Van Packer
- C. Jeremias
- D. Shebler
- E. Or approved Equal

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. The chimney shall be supported on a foundation of masonry or reinforced concrete or other non-combustible material having a fire-resistance rating of not less than three hours. The base of the chimney shall be secured to prevent movement of the chimney and anchor lugs should be used for this purpose whenever possible.
- B. Make sure the sections are properly aligned. The joint between the sections should be sealed with joint cement and the sections must be secured one to another by drawbands.
- C. Install a cleanout section in the chimney assembly but not above the chimney inlet.
- D. Provide a minimum clearance to non-combustible construction for maintenance and inspection purposes as follows: for sizes through 18" I.D. 2" min., for sizes over 18" I.D. 4" min.
- E. Each chimney must be guyed at least once above its fixed base if its height is more than 10 ft. The distance between gus should not exceed 10 ft.
- F. Those portions of a chimney installed within a building and not subjected to windload or other forces, may have a maximum stabilizer spacing of 35 ft. For chimney sizes through 18" I.D. and 40 ft. For chimney sizes through 60" I.D.

**END OF SECTION 23 51 00**



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**SECTION 23 52 10  
PIPING AND ACCESSORIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Pipe.
- B. Fittings.
- C. Unions and Couplings.
- D. Escutcheons.
- E. Sleeves.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Piping and piping auxiliary components shall meet or exceed the performance requirements specified in this specification section.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit AutoCAD computer generated shop drawings indicating anchoring details, anchor points, guide details, etc.
- C. Submit AutoCAD computer generated drawings of location and size of sleeves for openings in floors and walls
- D. Submit AutoCAD computer generated detailed piping layouts at 3/8" = 1'-0" scale for approval. Piping layouts shall be submitted for each individual construction phase, and for the entire completed project.



- E. Submit manufacturer's data for hangers and fittings.
- F. Submit dimensioned drawings to the Commissioner for approval showing pipe penetrations through core walls, slabs and other structural elements, anchor and guide locations, etc.
- G. Submit a schedule for pipe fittings.
- H. Submit a schedule for pipe sleeves.
- I. Submit a set of welding procedures for each pipe service.
- J. Submit a list of pipe welders proposed for all shop and field welding.
- K. Submit mill certificates for piping and fittings.
- L. Submit an overall piping schematic drawing (similar to a riser or isometric diagram) showing entire installed system.
- M. Submit plan drawings showing piping point loads to structure and supplementary steel layouts for all systems.
- N. Submit a line-by-line statement of compliance or non-compliance with this specification section.

#### **1.5 DESCRIPTION**

- A. Provide piping and accessories in accordance with the Contract Documents.

#### **1.6 WORK INCLUDED**

- A. Pipe.
- B. Fittings.
- C. Unions and Couplings.
- D. Escutcheons.
- E. Sleeves.
- F. Welding Procedures.

#### **1.7 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. All piping work to conform to the latest edition of the appropriate ANSI Code for Pressure Piping and Power Piping, including latest amendments.
- C. Employ only skilled welders, each holding a NYC License.



- D. The piping shown on the Drawings is indicated schematically to show the general distribution and system configuration. Coordinate with the work of other Sections and Divisions of the Specifications so as to provide a complete system, including approved rerouting, horizontal and vertical offsets, etc., to make the piping distribution fit within the confines of shafts, ceiling spaces, chases, equipment rooms, etc., all to the satisfaction of, or as directed by, the Commissioner.
- E. For high pressure steam piping, test steel pipe in accordance with the latest edition of the ASME standard for welded steel pipe under B31.1.
- F. Perform radiographic testing on high pressure steam piping (151 psi to 300 psi) according to the ASME Power Piping Standards.
- G. All piping shall be sourced from the United States (domestic supply).

## **PART 2 - PRODUCTS**

### **2.1 PIPING**

- A. Piping, fittings and accessories to be suitable for the pressure and temperatures of the service. Ascertain system working pressure and provide piping accordingly, based on the systems to be tested at 150 percent of maximum system working pressure.
- B. Galvanizing: Hot process inside and outside of pipe with zinc coating, minimum 3 oz. per sq. ft.
- C. For butt-welded piping, bevel ends as specified under "Welding of Piping". For screwed joint connections, ream cut ends of pipe to full diameter. Socket welded piping shall only be permitted for 1-1/2 inches and smaller. Ends shall be without burrs or other inward projections at the cut ends.
- D. All steel pipe is ERW or seamless type ASTM A-53, Grade B, unless noted otherwise. Dimensions and weights of steel pipe to conform to ANSI Standard B16.10.
- E. High pressure steam piping installation shall conform to the latest edition of ANSI B31.1 Code for Pressure and Power Piping, including latest amendment. All other piping shall conform to the latest edition of ANSI B31.9 Code for pressure and power piping, including latest amendments.
- F. For welded pipe, fittings shall be welding fittings and all pipe flanges shall be welding neck type.
- G. Copper pipe to be hard drawn conforming to ASTM B-88.

### **2.2 PIPE FITTINGS**

- A. Comply with latest edition of ANSI B16.3, B16.5, B16.9 and B16.11 standards.
- B. Provide steel elbows of long radius pattern.
- C. Fittings to be of the same schedule (weight) as the pipe to which it will be welded. Submit cut samples for approval if directed. Provide fittings which maintain full wall thickness throughout, ample radius and fillets, and proper bevels or shoulders at ends.



- D. Provide carbon steel welding flanges at all flanged valves and equipment, and as required for union connections. Flanges to be either slip-on type, bored to match diameter of pipe and front and back welded thereto, or welding neck pattern. Use flanges with a working pressure equal to 150 psi, or a minimum of 150 percent of the maximum system working pressure. Flanges for high pressure steam service to be 300 psi rating. High pressure steam service as relates to piping, fittings, valves and accessories is defined under these Contract Documents as steam at an operating pressure of 15 psig or higher.
- E. Provide cadmium plated or galvanized machine bolts with heavy pattern semi-finished hexagonal steel nuts to join flanges. Use studs threaded both ends where necessary to facilitate removal of valves or disassemble flanged fittings. All bolts used shall be "B-7" bolts plus studs plus threaded rods, using "2H" nuts.
- F. Provide 1/16 inch thick, non-asbestos gaskets between flanges made of compressed sheet on cold water piping only. Steam piping shall utilize "flexitalic" gaskets only.
- G. Use Teflon tape on male threads of screwed pipe (female).
- H. Screwed fittings to be inside threaded with threads cut clean and true.
- I. Copper fittings to be brazed fittings conforming to ASTM B16.5, B16.18 and B16.22.
- J. Branch piping connections for all steam service piping, feed water piping and condensate piping shall utilize tee fittings, reduced elbows, or shaped nipples only. No premade or purchased welded outlets, wet tap or stab-in type connections are permitted.
- K. Branch piping connections for other water service piping (chilled water, condenser water, hot water) shall utilize fittings, Weld-O-Lets, Thread-O-Lets, Bonney Forge or approved equal shaped nipples or approved equal only. No "Stab-in" connections are permitted.
- L. Provide reducing/increasing long radius elbows at pump inlet and outlet connections.

### 2.3 UNIONS AND COUPLINGS

- A. Provide unions where required for the removal of equipment. For piping 3" and smaller, use ground joint type of malleable iron with brass seats for iron pipe, and made of brass for brass pipe and copper tubing. For piping 4" and larger use 150 psi forged steel slip-on flanges for ferrous piping and bronze flanges for copper piping.
- B. Insulating Coupling Type: At each joint between steel or zinc (galvanized) and copper; up to 2" size, Capitol Series CS/FG, EpcO "Dielectric Union", Bonney Forge Union or approved equal.

### 2.4 BOILER BLOWDOWN PIPING AND FITTING SCHEDULE

- A. Piping:
  - 1. 3" thru 10" will be Schedule 40 A 106 Gr B Seamless Pipe Black Steel.
  - 2. 2 1/2" and smaller will be Schedule 80 A 106 Gr B Seamless Pipe Black Steel.



**B. Fittings:**

1. 2 ½" and larger will be weld fittings same schedule weight as the pipe to which it will be welded. ANSI B 16.9 ASTM A-234
2. 2" and smaller can be socket welded or threaded. Socket weld fittings will be a 105, 3000# forged steel. Threaded fittings will be 3000# Steel.

**C. Flanges:**

1. 2 ½" and larger will be 300# Weld Neck Flanges. ANSI B 16.5 ASTM 105
2. 2" and smaller can be Socket Weld, Weld-Neck or Threaded 3000# Flanges. ANSI B 16.5 ASTM 105

**D. Joints:**

1. 2 ½" and larger will be welded.
2. 2" and smaller can be welded or threaded.

**E. Branch Connections:**

1. Where applicable branch connections to steel pipe will be made with tee fittings only.

**F. Bolts and Nuts:**

1. ASTM A 307 GR "B7" bolts and Grade "2H" nuts.

**G. Gaskets:**

1. Flexitallic Style "CG", US Pipe, Garlock or approved equal.

**2.5 PUMPED CONDENSATE PIPING AND FITTING SCHEDULE**

**A. Piping:**

1. 10" and larger will be extra strong A 53 Gr B Seamless Pipe Black Steel
2. 8" and smaller will be Schedule 80 A 53 Gr B Seamless Pipe Black Steel

**B. Fittings:**

1. 2 ½" and larger will be welded fittings same schedule weight as the pipe to which it will be welded. ANSI B 16.9 ASTM A-234
2. 2" and smaller will be Screwed Steel Fittings 2000#.



C. Flanges:

1. 2 ½" and larger will be 150# Weld Neck or Slip On Flanges.
2. ANSI B 16.5 ASTM 105
3. 2" and smaller can be Weld-Neck, Socket Weld, Slip-On or Threaded 3000# Steel.

D. Joints:

1. 2 ½" and larger will be welded.
2. 2" and smaller will be screwed.

E. Branch Connections:

1. Where applicable branch connections to steel pipe will be made with Tee fittings only.

F. Bolts and Nuts:

1. ASTM A 307 Gr "B7" bolts and grade "2H" nuts.

G. Gaskets:

1. Garlock 3000, Flexitallic, US Pipe or approved equal (suitable for 1200°F)

**2.6 HOT WATER AND GLYCOL SYSTEM MAINS PIPING AND FITTING SCHEDULE**

A. Piping:

1. 12" and larger will be standard weight A 53 Gr B Seamless Pipe, Black Steel.
2. 3" to 12" and smaller will be Schedule 40 A 53 Gr B Seamless Pipe, Black Steel.
3. 2 ½" and smaller will be Type "L" copper.

B. Fittings:

1. 3" and larger will be weld fittings same schedule weight as the pipe to which it will be welded. ANSI B 16.9 ASTM A-234.
2. 2 ½" and smaller will be brazed ANSI B16.22 Wrought copper.

C. Flanges:

1. 3" and larger will be Weld Neck or Slip On 150# Flanges. ANSI B 16.5 ASTM 105
2. 2 ½" and smaller will be brazed Socket Weld copper flanges



D. Joints:

1. 3" and larger will be welded.
2. 2 ½" and smaller will be brazed or soldered.

E. Branch Connections:

1. Where applicable branch connections to steel pipe will be made with tees, weld-o-lets, thread-o-lets, socket-o-lets, or approved equal ½ couplings.

F. Bolts and Nuts:

1. ASTM A307 Grade B7 bolts, and grade 2H nuts.

G. Gaskets:

1. Garlock 3000, Flexitallic, US Pipe or approved equal

**2.7 VENTS AND EQUIPMENT DRAINS PIPING AND FITTING SCHEDULE**

A. Piping:

1. 12" and larger will be Standard Weight A53B ERW Black Steel Pipe.
2. 10" and smaller will be Schedule 40 A53B ERW Black Steel Pipe.
3. 2" and smaller can be L Copper Tubing Hard Drawn, Soft Annealed or A53B ERW Schedule 40 T&C Black Steel Pipe.

B. Fittings:

1. 2 ½" and larger will be Weld Fittings the same schedule as the pipe to which it will be welded. ANSI B 16.9 ASTM A234.
2. 2" and smaller will be Threaded Black Cast Iron Fittings 125# or ANSI B16.29 Wrought Copper Fittings (Contractors Option to install larger sizes.)

C. Flanges:

1. 2 ½" and larger will be 150# Weld Neck or Slip On Flanges ANSI B16.5, ASTM 105
2. 2" and Down will be 125# C1 Screwed Flanges.
3. Copper sweat will be 125# Sweat Bronze Companion Flange ASTM B584.



**D. Joints:**

1. 2 ½" and larger will be welded.
2. Copper systems Soldered with 95/5 SN/SB.
3. Threaded 2" and down.
4. Di-Electric Fittings or Isolation gasket sets will be used between Copper/Steel services.

**E. Branch Connections:**

1. 2 ½" and larger will use fittings or fabricated laterals.
2. Copper system will be made with Tee Fittings.

**F. Bolts and Nuts:**

1. ASTM A307 Grade B7 Bolts and Grade 2H Nuts
2. Exterior Cooling Tower will be hot dipped galvanized, all other exterior locations can be plated.

**G. Gaskets:**

1. Garlock 3000, Flexitallic, US Pipe or approved equal
2. Isolation gasket sets where applicable.

**2.8 ESCUTCHEONS**

- A. Cast iron or cast brass, deep type, to cover sleeve hubs or fitting projections. Provide escutcheons for exposed piping through floors, ceilings, walls and partitions in finished areas, and piping through all fire rated separations. Attach escutcheon to building material, not to pipe.

**2.9 SLEEVES**

- A. Construct sleeves for pipes passing through partitions, hung or furred ceilings, etc., of not lighter than 18 gauge galvanized steel.
- B. Provide standard weight galvanized steel pipe sleeves at all penetrations of foundation walls, block walls, reinforced concrete walls, and all floor and roof slab penetrations.
- C. Provide 25 gauge waterproof galvanized sheetmetal counter-flashing at all pipe roof penetrations.

**2.10 MANUFACTURERS**

**A. Pipe**

1. U.S. Steel "National"



2. Ohio Pipe
  3. LTV-E
  4. Van Lewen
  5. Or approved equal
- B. Welding Fittings**
1. Weldbend
  2. Tubco
  3. Cajon
  4. Naylor
  5. Ladish
  6. Van Lewen
  7. Or approved equal
- C. Copper Pipe and Fittings**
1. Mueller Brass
  2. Nibco
  3. Reading Tube
  4. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. Preparation**
1. Ream and de-burr pipes and tubes.
  2. Clean of scale and dirt, inside and outside, before assembly.
  3. Remove welding slag or other foreign material from piping.



B. Installation

1. General:

- a. The drawings indicate generally the size and location of piping and while sizes must not be decreased, the Contractor may change locations of pipes in order to accommodate conditions at the job.
- b. Closely plan and coordinate concealed piping and ductwork above suspended ceilings to avoid interferences, and install to maintain suspended ceiling heights shown on architectural drawings.
- c. Install exposed work in a neat, workmanlike manner; parallel to the closest wall with maximum headroom. Avoid light fixtures.
- d. Properly grade piping to secure easy circulation and prevent noise and water hammer. Pitch horizontal pumped water piping 1 inch in 60 feet upward in direction of flow. Pitch steam and condensate piping 1 inch in 40 feet downward in direction of flow. Pitch gravity water piping one foot in 100 feet downward in direction of flow.
- e. Install (at traps, instruments, etc., and wherever else directed) approved unions, to permit easy connection and disconnection.
- f. Make riser branches and other offsets with 4-elbow swings including copper risers and branches.
- g. To meet job conditions offset water supply and return mains up and down. Provide drain cocks with hose connection and chained cap (minimum 3/4 inch) at low points and vent traps at high points.
- h. After systems are in operation, if coils do not circulate quickly and noiselessly (due to trapped or airbound connections), make proper alterations in these defective connections including altering finished construction and refinishing without additional cost.
- i. Pipe Nipples: Pipe 3 inch in length and less is considered a nipple. Nipples to be of extra heavy construction. Do not use close nipples.
- j. Do not use short lengths or nipples at locations where a full length of pipe will fit.
- k. Make piping connections to coils and equipment with offsets provided with screwed or flanged unions so arranged that the equipment can be serviced or removed without dismantling the piping. Do not screw unions directly to coil header piping connections.
- l. Cut screw threads clean and true. Do not use bushings. Make reductions with eccentric reducers or eccentric fittings to permit draining unless otherwise indicated. Ream out pipe 2 inch and less after cutting to remove burrs.
- m. Make flanged connections with flange faces true and perpendicular to the center line of the pipe to which the flanges are attached.



- n. Allow space for pipe insulation.
- o. Provide dielectric couplings at all junctions of copper and steel or galvanized piping.
- p. Provide for expansion and contraction of piping systems.
- q. Use main sized saddle weld-o-lets, thread-o-lets, Bonney Forge or approved equal, type branch connections for directly connecting branch lines to mains in steel piping if main is at least one pipe size larger than the branch for up to 6 inch mains and if main is at least two pipe sizes larger than branch for 8 inch and larger mains. Do not project branch pipes inside the main pipe. Use of welding tees are permitted for all sizes.
- r. Cap all openings in pipes during progress of the work.
- s. Do not connect bottom of pipe risers until riser is complete. Rod or tap to clear loose material before making bottom connection.
- t. Correct leaks in piping immediately using new materials. Leak-sealing compounds or peening is not permitted.

2. Supports:

- a. Support or suspend piping properly on stands, clamps, hangers, etc., of approved design and make. Install supports to permit free expansion and contraction while minimizing vibration. Anchor pipes where shown or required by means of steel clamps, or other approved means, securely fastened to the pipe and the building construction. Follow MSS standards for supports of piping.
- b. Provide structural pipe supports including supplemental steel channels, angles, columns, etc., necessary to complete the installation. The provision of structural supports over and above that required for the building structure is the responsibility of this Section.
- c. Prior to installation of hanger rods and other pipe supports, obtain approval from the Commissioner for proposed method of hanging and for exact location of all mounting points. Submit weights and location of all piping to the Commissioner for approval well in advance of general construction work to allow sufficient time for structural redesign to accommodate the installation.
- d. Place piping in proper alignment and position prior to connection to anchors, expansion loops, joints and equipment. Furnish jacking devices, temporary steel structural members and assembled structures as necessary. Remove temporary equipment and structures at the completion of the work.
- e. Reinforce piping at anchor points.
- f. For life safety systems only seismic supports are required as indicated in the New York City Building Code. Contractor shall provide signed and sealed calculations and submittals by a licensed professional engineer for proper seismically designed supports.



3. Sleeves:

- a. Provide sleeves for all pipes passing through floors, rated partitions and walls of sufficient diameter to accommodate pipe covering where such is required. Set sleeves for concrete floors, walls, and other masonry work in place before the floors or walls are poured or built. Locate sleeves secure in place so that space all around the pipes, after the pipes are installed in place is about equal. Anchor sleeves by use of anchor flanges embedded in concrete or at each end of sleeve. Properly firestop around sleeves after wall is constructed.
- b. Provide sleeves for all pipes passing through non-rated partitions or ceilings. Size sleeves to accommodate pipe covering where applicable. Sleeve seam to be drive slip. Sleeve to be flanged 1" at each end to lock sleeve into penetration.
- c. For sleeves at penetrations of the metal deck, attach to the deck prior to the pouring of the deck concrete. Set sleeves in such a manner so that no concrete fills their interior during the concrete pouring operations.
- d. Caulk floor sleeves for exposed pipes watertight and project sleeve approximately 2" above the finished floor. Finish sleeves flush with the bottom of slab and also with the finished faces of wall.
- e. Provide sleeves with an inside diameter at least  $\frac{1}{2}$ " greater than outside of pipe served, including pipe insulation which must be continuous through sleeve, except as detailed on the Drawings.
- f. Where piping penetrates non-rated walls, partitions, etc., pack space between piping and sleeve with mineral wool. At penetrations through foundation walls, rated walls, and floor slabs provide firestop material as specified and shown on the Drawings.
- g. Do not support pipes by resting clamps on sleeves. Clamps must extend beyond sleeve and be supported outboard of sleeve in an approved manner. In no case shall sleeves be cut or slotted to accommodate pipe clamps.
- h. Where space for future pipes and conduits is required, provide sleeves and fill with lightweight concrete.
- i. Sleeves penetrating floor and roof slabs shall extend at least 2" above slab.
- j. Cover all pipe/sleeve/firestopping gaps using escutcheons.

4. Drain Installation:

- a. Coils and vessels which contain water to have connections suitably located, and valved outlets, to permit individual venting and draining.
- b. Provide valved drains with hose bibb at low points of piping systems and at the bottom of each riser.



- c. Provide cooling coil condensate drains, fan drains, and all unit casing drains with 2-inch minimum trap seal, unless otherwise noted, to spill over floor drains.
  - d. Provide 1-inch minimum drain lines in sheet metal intake and discharge plenums not indicated to have floor drains. Pipe drains to nearest approved indirect waste.
5. Except as noted, make soldered joints with 95% tin and 5% antimony solder, having a melting point of not less than 460°F. Thoroughly clean solder joints before the application of the solder. Cut pipe square with burrs removed and apply flux before soldering.
6. Make brazed joints using brazing alloys with a melting point at or above 1,000°F.
7. Refrigerant Systems:
  - a. Back purge refrigerant tubing with nitrogen during brazing operations.
  - b. Grade all refrigerant lines for proper oil return to compressor.
8. Install automatic valves, insertion pipe wells and energy meters in piping systems as required and indicated on the drawings.

**END OF SECTION 23 52 10**



**Department of  
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**SECTION 23 52 35  
PACKAGED WATER TUBE BOILERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide packaged water tube boilers in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Hot water packaged water tube boiler with gas fuel burner - natural gas, fully wired and piped control panel and console.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. The boiler pressure vessel shall be constructed in accordance with ASME Boiler Code, and must receive authorized boiler inspection prior to shipment. A copy of the inspection report shall be furnished to the purchaser. The complete packaged boiler-burner unit shall be listed by Underwriters Laboratories', and shall have the UL/cUL label affixed to the front head.
- C. Shop Drawings
  - 1. Dimensioned drawings with operating weights, piping, connections and flue connections. Wiring diagrams, fuel train diagrams, control interface diagrams, and instrumentation and control diagrams.
  - 2. Wiring diagrams for all controls, including panel layout and remote devices.



**D. Product Data**

1. Performance data including:
  - a. Rated flow rate.
  - b. Fuel consumption, per hour under rated and part load (75%, 50%, 25%) conditions.
2. Statement of guaranteed output efficiency at 25%, 50%, 75%, 100% for each fuel burned.
  - a. Percent carbon dioxide in flue gas at 100% rated load.
  - b. Flue gas temperature at 100% rated load.

**E. Test Reports**

1. Certification of sound pressure levels for high and low firing rates.
2. Certification of all factory tests as required herein.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Conform to the equipment and performance standards of the following agencies:
  1. Local gas utility.
  2. New York City Department of Environmental Protection.
  3. NFPA requirements.
  4. OSHA standards, particularly for sound levels.
  5. U.L. listings and labels as indicated in the technical specifications.
  6. ASME.
  7. State Department of Environmental Conservation, Division of Air Pollution Control.
  8. IRI requirements for boiler burner.
- C. Furnish major elements of the package boiler system by a single-source vendor to assure design installation and service interface, and to provide in-warranty and post-warranty unified responsibility for the Commissioner.
- D. Design the boiler and construct in accordance with the latest edition of the ASME Power Boiler Code.



- E. Perform a shop hydrostatic test at the manufacturer's expense, and two (2) certified manufacturer's data reports covering the shop inspection shall be furnished.
- F. Minimum heating surface (per ABMA definition) is indicated on the Drawings.

## **PART 2 - PRODUCTS**

### **2.1 HOT WATER BOILER PACKAGE**

#### **A. General Boiler Design**

1. The boiler shall be a two-drum, flexible watertube design with a tangent-tube waterwall furnace mounted on a heavy steel frame. Top, bottom and sides of the furnace shall be water cooled.
2. The boiler drums shall be furnished with handholes to facilitate boiler inspection and cleaning.
3. Boiler tubes shall be 1.5" diameter, with 0.095" wall thickness, and shall be easy to remove and replace without expanding or welding the tube attachment to the drums.
4. The boiler shall have sufficiently sized downcomers to provide natural internal circulation.
5. The burner shall be mounted on a hinged backing plate for easy access to the furnace.
6. Observation ports for the inspection of flame conditions shall be provided at the rear of the boiler, and in the burner assembly at the front.
7. The tangent-wall tubes shall be covered with 3 inches of insulation under a gas-tight, 11-gauge casing, and a 22-gauge steel outer casing. The boiler base frame and other components shall be factory-painted before shipment, using a hard-enamel finish.

#### **B. Hot Water Boiler Trim**

1. The following items will be installed on the boiler.
  - a. **Low Water Cut-Off:** A probe-type, low water cut-off control shall be mounted in the upper drum. It is to be wired to the burner control circuit to prevent burner operation if the boiler water falls below a safe level.
  - b. **Miscellaneous:** A combustion temperature and pressure gauge shall be mounted on the boiler. Temperature controls, for regulation of burner operation, shall be mounted on the boiler and the temperature sensing element shall be located adjacent to the boiler outlet. Water relief valves (shipped loose) shall be of a type and size to comply with ASME Code requirements.



C. Burner Controls

1. The boiler shall be provided with a UL/cUL approved fuel burning system
  - a. The complete fuel burning system shall be in full accordance with Factory Mutual (FM) requirements.
2. Burner Description
  - a. The boiler shall include a gas burner having rated capacity as scheduled.
  - b. The burner shall be forced draft type with full firing rate modulation. All combustion air shall be furnished by the burner fan which shall be an integral part of the burner.
  - c. The gas burner shall burn the specified quantity of fuel without objectionable vibration, noise, or pulsation, with not more than 15% excess air and less than 50 ppm (corrected to 3% O<sub>2</sub>) CO in the products of combustion. In addition, when firing gas, the burner shall be guaranteed to produce less than 60 ppm (corrected to 3% O<sub>2</sub>) NO<sub>x</sub> emissions, and further shall be designed for future field conversion to operate at 30 ppm (corrected to 3% O<sub>2</sub>) NO<sub>x</sub> emissions or less without replacing the complete burner assembly.
  - d. Primary-secondary air control shall be a design function of the combustion head. Combustion heads requiring an internal adjustment shall not be acceptable
  - e. The burner shall be equipped with an aluminum reverse curve fan for lower fan motor hp requirements and self-cleaning characteristics.
  - f. A permanent observation port shall be provided in the burner to allow observation of both the pilot and main flame. Both the pilot and the flame scanner shall be easily accessible without opening or disassembling the burner.
  - g. All burner controls are to be for use on 120 volts, 1 phase, 60 Hz.
  - h. The burner shall be factory fire-tested to ensure proper operation before shipment.
3. Gas Valve Train for Each Burner
  - a. Provide a pressure gauge to indicate the gas burner manifold pressure.
  - b. Furnish and install one manually operated, ball valve upstream of all valves.
  - c. Provide one main gas pressure regulator (of tight shutoff type) with vent to outside atmosphere
  - d. Provide one automatically operated motorized safety gas valve. One safety shutoff valve shall be proven closed during pre-ignition by proof of valve closure interlock switch on valve.
  - e. Provide a second automatically operated gas safety shutoff valve to operate simultaneously with the above gas valve.



- f. A manually operated gas valve shall be located downstream of both automatic gas valves to permit leakage testing of the valves.
  - g. Gas pressure monitoring shall be provided by approved pressure switches interlocked to accomplish a non-recycling safety shutdown in the event of either high or low gas pressure.
4. Burner Controls
- a. The full modulation of the burner shall be controlled by water temperature by means of a temperature control.
  - b. An additional high limit safety temperature control of the manual reset type shall be provided to control the burner.
  - c. Pre-and post-operation of the burner fan shall be provided per current UL/cUL requirements.
  - d. The burner shall utilize a Fireye, Powerflame, Webster or approved equal type flame safeguard programmer, incorporating 7 LED indicator lights to annunciate the current operating status of the burner.
  - e. A manual restart of the burner shall be necessary in the event of shutdown due to flame failure.
  - f. All three-phase motors shall be controlled and protected by an automatic starter with thermal overload protection. The starter shall be inter-locked to prevent burner operation when over-load relays are tripped out.
  - g. Supply a burner-mounted diaphragm air flow switch to prevent energizing the main fuel valves in the event of insufficient combustion air, or to provide safety shutdown in the event of combustion air interruption.
  - h. A factory-wired control cabinet shall be supplied and mounted on the burner. The control cabinet shall house the flame safeguard control, programming timer, burner motor starter, fuses, control circuit transformer, control switches, alarm bell with automatic reset silencing switch to ring on low water or flame failure, indicating lamps, and relays as required.
  - i. Provide four individual lights with nameplates on the control cabinet to indicate "call for heat," "main fuel valve on," "low water," and "main flame failure."
  - j. The burner shall be equipped with suitable fuel and air controls to assure smooth main flame ignition. The burner shall utilize a proportional air flow damper design, including independent low-fire and high-fire air flow shutter assemblies for ease of adjustment and consistent excess air performance throughout the firing range.
  - k. Low fire start shall be provided for ignition of fuel. Pre-ignition air flow rate shall be not less than 60% maximum firing rate air flow. Full modulation on both fuels shall be provided.



1. Electronic safety combustion controls shall be supplied, complete with ultra-violet flame scanner to monitor the pilot and main flame. It shall be so utilized as to provide intermittent type gas-electric ignition and pre-ignition timer. Flame rod will not be permitted for proving pilot or main flame.

**D. Efficiency**

1. The boiler shall operate at a minimum fuel-to-water efficiency of 80%, energy efficiency of 87% minimum.

**E. Warranty**

1. The boiler pressure vessel shall be warranted against damage resulting from thermal stress for a period of 20 years from date of shipment, provided the boiler is operated and maintained in accordance with the conditions specified in the Manufacturer's Operating and Maintenance Manual.

**F. Field Erectable**

1. The specified boiler/burner package shall be shipped disassembled for field assembly. All pieces and components must fit through a standard doorway. Assembly shall be accomplished with ordinary hand tools, with no welding or rolling required. Major casing components are to be shipped with insulation and refractory installed for ease of assembly.

**2.2 MANUFACTURERS**

**A. Manufacturers**

1. Lochinvar
2. AERCO
3. Cleaver-Brooks
4. Slant-fin
5. Or approved equal

**PART 3 - GENERAL**

**3.1 MANUFACTURERS**

- A. Provide periodic supervision of installation by boiler system vendor. Include all time required for startup and adjustment of system elements and a full inventory of recommended replacement parts for specified equipment. Boiler system vendor shall provide five (5) 8-hour days for instruction of City of New York's operating personnel.



- B. Package boiler system vendor shall submit monthly report and check list to City of New York's operating personnel, concerning status of covered equipment with respect to operating efficiency, compliance with manufacturer's recommended operating and maintenance procedures, recommended replacement parts, and suggested change in operating procedures.
- C. Package boiler system vendor service organization shall employ senior service technicians, having experience in all aspects of troubleshooting, corrective service, preventive maintenance and reporting.
- D. The package boiler system vendor's service force shall be "In-House".

### **3.2 FIELD TESTING**

- A. Contractor to perform full field operational and performance testing.
- B. Contractor to supply all labor, materials, connections, utilities, and equipment as required to perform complete job site testing of each boiler at 100% load.
- C. All controls and alarms to be verified operational.
- D. Test procedures to be submitted and approved prior to testing.
- E. Test results to be submitted and approved by commissioner prior to substantial completion of boiler plant.

**END OF SECTION 23 52 35**



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**SECTION 23 55 10  
REFRIGERATION MACHINES (AIR COOLED)**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].
- B. Provide air cooled refrigeration machines, as described herein, in accordance with the Contract Documents. Units to be completely self-contained with compressors, condenser, condenser fans, starters, controllers, wiring and piping mounted on a common frame.

**1.2 WORK INCLUDED**

- A. Air-cooled scroll chiller.
- B. Reduced Voltage Starters.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's drawings indicating certified dimensions, weights, minimum clearances, and wiring diagrams.
- C. Submit manufacturer's data indicating model numbers, and certified performance characteristics (KW input vs tonnage output) at 100%, 80%, 60%, 40%, and 20% of rated capacity. Include certified sound power levels.
- D. Submit manufacturer's test reports for each machine.
- E. Submit ASME certification.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Construct refrigeration machines to comply with the following standards organizations:
1. ANSI/ARI 550 - Centrifugal or Rotary Water Chilling Packages.
  2. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.
  3. ANSI/ASHRAE 90.1-2013 - Energy Standard for Buildings Except Low-Rise Residential
  4. ANSI/ASME SEC 8 - Boiler and Pressure Vessel Code.
  5. NFPA 70.
  6. UL 465, 200, 230 and 460-3-60.
- C. Performance to be ARI certified.
- D. Performance test each machine at factory prior to shipment.
- E. The compressors are to be completely assembled at the factory and hydrostatically tested either before or after assembly of shaft and rotor. Pressure test the compressors after assembly with a mixture of refrigerant and air, the casing, joints and connections being tested with a Halide torch. After assembly of the complete unit on the job, pressure test the unit with a mixture of refrigerant and air, and test all connections and welds with a Halide torch and make refrigerant-tight. The complete unit to be dehydrated by producing a vacuum of .03 in Hg absolute, maintained for 4 hours. At the end of this period the pump is to be stopped and vacuum maintained in refrigeration unit for a period of 24 hours without losing more than .01 in Hg.
- F. Factory performance test each chiller under full load conditions in an ARI certified test facility with water flowing through the cooler. Supply a certified test report to confirm performance as specified. Make proper ARI certification documents for the test loop available upon request for inspection. Conduct the performance test in accordance with ARI Standard 550-90 procedures and tolerances. Use factory test instrumentation per ARI Standard 550 and the calibration of all instrumentation shall be traceable to the National Institute of Standards and Technology. Forward a certified test report of all data as part of the project documentation.
- G. Refrigerant to be non-ozone depleting in accordance with ASHRAE Guideline 3-1990.

## **1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.



## **PART 2 - PRODUCTS**

### **2.1 ELECTRICAL SCROLL TYPE REFRIGERATION MACHINES**

- A. Provide each chiller unit consisting of a scroll compressor, motor, evaporator, condenser, refrigerant and oil operating charges and microprocessor control system.
- B. Compressor
  - 1. Equip each unit with a field serviceable, direct drive 3600 rpm, single scroll type.
  - 2. Shall have helical grooves and be constructed of a high alloy steel. The gaterotors shall be constructed of a carbon impregnated engineered composite material. The gaterotor supports shall be constructed of cast iron.
  - 3. The semi-hermetic compressor shall utilize an internal economizer cycle to enhance the unit's refrigeration effect and to allow the compressor to run at a more efficient operating point.
  - 4. A liquid refrigerant injection system shall be utilized to seal potential leakage paths between high and low sides of the compressor.
  - 5. Slide valve modulation shall be provided for unloading control.
  - 6. The electric motor shall be hermetically sealed, squirrel cage induction type and cooled by liquid refrigerant. Compressor power factor shall be 0.90 or greater.
- C. Evaporator
  - 1. Provide evaporator of the direct expansion type with carbon steel barrel, polypropylene water baffles to resist corrosion, and seamless, internally finned high efficiency copper tubes. Tubes shall be roll expanded into heavy carbon steel tube sheets. Refrigerant heads shall be carbon steel and removable to permit access to tubes from either end. For easy removal of water, vent and drain plugs shall be provided on the shell.
  - 2. The evaporator shall be wrapped with an electric heater cable and insulated with 3/4" 19mm thick closed cell polyurethane insulation  $K=0.28$  at 75°F 23.9°C to provide freeze protection down to -20°F - 28.8°C ambient air temperature. The insulation shall be fitted and cemented in place, then painted with a resilient vinyl paint to resist cracking.
  - 3. The evaporator shall be designed for refrigerant side working pressure of 225 psig 1552 kPa and water side working pressure of 175 psig 1207 kPa. The evaporator shall be designed, constructed, inspected and stamped in accordance with ASME Code requirements.



D. Condenser

1. Construct the condenser coils of 3/8" 9.5mm O.D. seamless copper tubes and mechanically expanded into plate type aluminum fins. The fins shall have full drawn collars to completely cover the copper tube for protection against atmospheric corrosion. A subcooling coil shall be an integral part of the main condenser coil.
2. Condenser fans shall be propeller type arranged for vertical air discharge and individually driven by direct drive fan motors. Fan blades shall be a painted steel or unpainted aluminum. Each fan shall be protected by a heavy-gauge fan guard.
3. Condenser fan motors shall be three-phase, direct drive, open drip-proof type positioned within the unit cabinet for weather protection.

E. Electric Panel

1. Field power connection, control interlock terminals and unit control system shall be centrally located in a NEMA Type 3R weatherproof enclosure. Panel access doors shall be key locked and include steel rod door retainers to prevent flapping while open. Provide barrier panels to protect operator against accidental contact with line voltage components when accessing control system. Power and starting components shall include factory fusing of fan motors and the control circuit; individual compressor circuit breakers; starting contactors including individual contactor for each fan motor stage; microprocessor-based compressor sequencing and start timers; compressor three-phase overload protection; inherent condenser fan motor overload protection; and unit power terminal blocks for field connection to remote disconnect switches. Terminals shall be provided for field connection of a 115 volt power supply to the control circuit and evaporator freeze protection heater circuit.

F. Control System

1. Provide a microprocessor-based control system for monitoring and control of the air-cooled chiller based on the leaving evaporator water temperature. The microprocessor control system shall include electronic expansion valves and utilize advance fuzzy logic control to provide optimized superheat control of the refrigerant circuits. The microprocessor controller shall provide at least 5 steps of fan control for each circuit to maintain optimum condenser pressure control for maximum operating unit efficiencies. Ambient temperature thermostats and pressure switches are not acceptable. The microprocessor shall continuously calculate the optimum condenser pressure for each circuit based upon compressor capacity, outside air temperature and number of condenser fans in operation.
2. The controller shall contain a 12-keypad and 32-character digital display that provides access to temperature, pressures, setpoints, operating states, schedules and alarm messages in plain English. Coded messages are not acceptable. The controller shall be able to log chiller operating conditions so that the operator can view them from a single keypad/display. The controller shall include password protection to guard against unauthorized or accidental setpoint or parameter changes.
3. The microprocessor control system shall provide display of the following:
  - a. Leaving and entering evaporator water temperatures.



- b. Evaporator refrigerant pressure and saturated temperature for each circuit.
  - c. Condenser refrigerant pressure and saturated temperature for each circuit.
  - d. Suction line and calculated superheat temperatures for each circuit.
  - e. Liquid line and calculated subcooling temperatures for each circuit.
  - f. Outside air temperature.
  - g. Electronic expansion valve operating position.
  - h. Programmed setpoints and operating states.
  - i. Alarm messages.
  - j. All temperatures shall be displayed with 0.1°F °C resolution.
  - k. All pressures shall be displayed with 0.1 psi 1kPa resolution.
4. The microprocessor control system shall include the following features:
- a. Panel face mounted emergency unit shutdown switch.
  - b. Panel face mounted manual pumpdown switches for each circuit.
  - c. Nonrecycling pumpdown control.
  - d. Advanced condenser pressure control algorithm.
  - e. Automatic control of chilled water pump through factory supplied digital output contacts.
  - f. Remote alarm output.
  - g. Precise digital setting of leaving chilled water temperature setpoint 0.1°F °C resolution.
  - h. Pre-alarm logic and status indication to avert shutdown during critical periods allowing time to take corrective action prior to a shutdown.
  - i. Complete warning and alarm diagnostics to inform operator of warnings and faults in plain English. Warnings and faults to be time and date stamped. In addition, the operating conditions that existed just prior to shutdown shall be able to be recalled. Specifically, time, date, evaporator and condenser pressures, and suction and liquid line temperatures shall be recorded when an alarm occurs.
  - j. Fault history shall maintain log of previous 5 alarms per circuit.



- k. Soft load function to prevent the unit from operating at full load during the chilled water temperature pulldown period.
  - l. Reset of leaving evaporator water temperature setpoint from an external 4-20mA signal or entering evaporator water temperature.
  - m. Demand limit control from an external 4-20mA signal.
  - n. Automatic lead-lag control of refrigeration circuits. Automatic mode shall equalize starts and run hours on all compressors.
  - o. Run time and number of starts totalization for each compressor.
  - p. Internal time clock to allow the operator to program a yearly schedule during the week, weekend and holidays. Time clock shall be a 7-day plus holiday schedule including 14 holiday dates which shall allow for a separate schedule on the holiday selected. Time clock shall incorporate an override function which will place the unit into an occupied time period for a programmable duration.
  - q. Auto-restart after power failure with no external battery backup or auxiliary power supply required for maintaining program memory.
  - r. Open Protocol communication capability.
  - s. Keypad selectable display units for either English °F and psi, or metric °C and kPa, units.
5. The microprocessor control system shall include the following safeties and protective devices:
- a. Phase loss, phase reversal with under and over voltage protection.
  - b. Motor protection for each compressor.
  - c. High condenser refrigerant pressure unloading for each circuit.
  - d. High compressor discharge pressure cutout for each circuit.
  - e. Freeze protection for each circuit.
  - f. Low evaporator refrigerant pressure unloading for each circuit.
  - g. Low evaporator refrigerant pressure cutout for each circuit.
  - h. Chilled water freeze protection.
  - i. Loss of chilled water flow.
  - j. Loss of refrigerant charge.



- k. Evaporator pressure sensor failure.
- l. Condenser pressure sensor failure.
- m. Volts ratio sensor failure.
- n. Leaving chilled water sensor failure.
- o. Phase/voltage failure.

**G. Low Ambient Operation**

- 1. The air-cooled chiller shall be provided with automatic head pressure control to permit satisfactory operation at ambient air temperatures down to 30°F -1.1°C by controlling condenser fans in response to refrigerant head pressure, compressor capacity and ambient air temperature.

**H. Refrigerant Circuits**

- 1. The air-cooled chiller shall have refrigerant circuits completely independent of each other with one compressor per circuit being utilized. Multiple compressors on a single circuit are not acceptable. Each circuit shall include an electronic expansion valve, compressor suction and discharge service valves, manual liquid line shutoff valve with charging connection, replaceable core filter-drier, liquid line sight glass with moisture indicator, liquid line solenoid valve, purge valves 450 psig 3104 kPa relief valves and insulated suction line.
- 2. Provide a liquid line solenoid valve to prevent liquid refrigerant from entering the compressor in case of a power failure where the electronic expansion valve would not be able to close.
- 3. Each circuit shall include two pressure transducers, one for the evaporator and one for the condenser. The output shall feed directly to the microprocessor control system. Calculated pressure readings are not acceptable.

**I. Manufacturers**

- 1. Trane
- 2. Carrier
- 3. Johnson Controls
- 4. Or approved equal

**2.2 REDUCED VOLTAGE STARTERS**

- A. Combination starter to be supplied by the centrifugal rotary chiller manufacturer. Reduced voltage starter to be closed transition star delta type complete with suitable 3 leg overload protectors.



- B. Mount starters in free-standing NEMA 1 enclosure on the chillers designed for top or bottom cable entry. Enclosure to have front access with adequate working clearance for line and load wiring. Wiring in spaces above resistors is not permitted. Starters to have metal nameplate showing manufacturer, serial number, voltage, maximum locked rotor amps, maximum overload trip setting, and short circuit current bracing, fusing for the oil pump starter, a lock-off stop button, three-phase ammeter and three-phase voltmeter with current transformer. Ammeter, voltmeter and transfer switches to be mounted in the front of the cubicle to read line current and voltage.
- C. Contactor to be air break design to carry specified current (OLT) on continual basis without damage during normal condition and designed to break specified (LRS) current repeatedly without damage during operation. Entire chiller starter assembly to be rated for maximum 30,000 amps RMS symmetrical.
- D. Starters to limit in-rush to 33% of locked rotor amperage.
  - 1. Transition resistors are to be located outside main starter casing and vented as required.
- E. Control circuit to have hand reset, inverse time magnetic overload relays set to hold motor in during acceleration which may last as long as 45 seconds at full voltage, and ultimately trip at 105% motor LRA rating. Trip setting and time setting to be independent of one another.
- F. Starter to be equipped with pilot relay bridging main centrifugal control panel control circuitry to initiate start sequence of compressor. Provide pilot relay with 120 V coils designed to carry control current without damage and to disengage upon release without fail. Fuse type to be Fusetron with minimum interrupting capacity of 100,000 amperes.
- G. Centrifugal starter to have two (2) extra N.O. interlocks on the run contactor, overload protection on each of the three phases, fused control circuits, and adjustable time limit acceleration to maximum of 90 seconds.
- H. Provide starter with solderless cable connectors for line and load sides.
- I. Size control transformer for the full burden in the control circuit. Minimum size of control transformer to be 1.5 KVA, fused on the primary side.
- J. Provide oil pump disconnect switch complete with fuses or circuit breaker. Size 00 full voltage oil pump starters with 120 V separate control to be furnished and mounted within starter enclosure, if not provided with the chiller.
- K. Provide space for possible future relays and contacts, to be specified later, for wiring to the supervisory control center.
- L. Affix permanent wiring diagram to inside of starter panel.
- M. Overloads: Provide an electronic inverse time 3-phase overload system. Monitor all three phases and use the highest output in the overload and current control system. Provide:
  - 1. Excessive locked rotor current protection.
  - 2. Excessive locked rotor time protection.



3. Current control of transition from wye to delta configuration.
  4. Excessive full load current protection.
  5. Protection of equipment against transition resistor failure.
  6. Phase unbalance protection.
- N. Distribution Fault: Provide a distribution fault system to protect the chiller from anomalies in the incoming power supply. System to consist of a sensor on each of the three phases and a monitoring device capable of detecting faults as low as 1½ electrical cycles in the incoming power supply. System to disconnect the compressor motor within six cycles of the fault detection.
- O. Provide an integral circuit breaker type disconnect switch without overcurrent protection elements. Switch to be rated for 65,000 amps interrupting capacity.
- P. Provide capacitors for 95% power factor correction for each chiller, complete with all associated wiring, switching and overcurrent protection.
- Q. Provide power transformer in each chiller starter to enable remote KW readings by the building automation system.
- R. Manufacturers
1. Allen Bradley
  2. Westinghouse
  3. Siemens
  4. Cutler Hammer
  5. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 REFRIGERANT AND LUBRICATING OIL**

- 3.2 Provide a complete charge of refrigerant and of approved lubricating oil for each refrigeration machine. Provide lubrication charts. Replace refrigerant and lubricating oil lost during the first year due to equipment defects at no cost to the City of New York.
- 3.3 Before units are started up, pump new grease into bearing housings to force out old grease and provide adequate lubrication.
- 3.4 Before acceptance of the equipment, all tests are to be conducted as required to demonstrate that the equipment operates mechanically and electrically as specified.



- 3.5 A satisfactory operational test is to be conducted in the presence of the Commissioner.
- 3.6 Power and water required for operation and testing will be furnished without cost to the City of New York.
- 3.7 If required for access into the building, disassemble each chiller at the factory; ship components charged with dry nitrogen; reassemble at job site under manufacturer's supervision and test for leaks. It is the Contractor's responsibility to determine the need for disassembly.
- 3.8 The Contractor is to install the chiller in accordance with the manufacturer's recommendations.
- 3.9 Chiller manufacturer is to provide properly trained service personnel for startup and Commissioner instruction.
- 3.10 Align chiller on concrete foundations and sole plates. Level and grout in place.
- 3.11 Install units on vibration isolation as specified in Section 23 05 48, "Vibration Isolation."

**END OF SECTION 23 55 10**



**SECTION 23 57 00  
HEAT EXCHANGERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide heat exchangers in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Plate and Frame Heat Exchangers.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
  - 1. Submit dimensioned construction shop drawings including certified performance data for each heat exchanger.
- C. Product Data
  - 1. Submit manufacturer's latest published data for materials and installation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. All heat exchangers to be built in accordance with the ASME Unfired Pressure Vessels Code, latest edition, and be so stamped.



- C. Units tested at a minimum of 1.5 times maximum system working pressure at full differential pressures for those exchangers rated at greater than 250 psi working pressure, and 1.5 times maximum system working pressure for those exchangers rated at or less than 250 psi. Unit must receive certified factory inspection prior to shipment. Furnish a copy of the inspection report to the City of New York.

## **PART 2 - PRODUCTS**

### **2.1 PLATE AND FRAME HEAT EXCHANGER**

- A. Furnish and install where indicated on drawings, plate-and-frame heat exchangers of the size scheduled.
- B. Plate-Frame Exchanger to be constructed of the following materials:
  - 1. Plates:
    - a. To consist of 304 stainless steel with a minimum thickness of 0.8 millimeters.
  - 2. Frame:
    - a. Fabricate the structural frame, consisting of both stationary and movable covers, upper and lower carrying bars, outrigger and compression bolting of carbon steel.
    - b. Construct the upper T-section hanger and the lower guide bar of stainless steel and provide a positive steering and locking mechanism for plate-to-plate alignment.
- C. Furnish nitrile gaskets suitable for the respective maximum system working pressures, temperatures and water treatment of each water system.
- D. Carbon steel nozzles to be rated for 150 percent of maximum system operating pressure and to be of the flanged type.
- E. Install the following items on the units:
  - 1. Two lifting lugs located on top.
  - 2. Roller assembly on the movable cover for ease of opening.
  - 3. Ball bearing assemblies for ease of tightening and untightening the unit.
- F. Paint all carbon steel fabricated components with Epoxy on all exterior surfaces.
- G. Provide sufficient surface area to perform the specified thermal duty plus additional surface area for fouling as recommended by the equipment manufacturer, but not less than 5%.
- H. Plate-Frame Exchanger to be equipped with insulated enclosure panels supplied by the unit manufacturer to meet OSHA requirements.



**I. MANUFACTURERS**

1. APV
2. Tranter
3. Graham
4. Bell and Gossett
5. Or approved equal.

**PART 3 - EXECUTION**

**3.1 NOT USED.**

**END OF SECTION 23 57 00**



**Department of  
Design and  
Construction**

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**SECTION 23 62 20  
ROOFTOP PACKAGE HEATING AND COOLING UNITS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide packaged rooftop air conditioning units heating units in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Air Cooled Packaged Units.
- B. Heating Only Units.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's latest data on capacity, dimensions and installation instruction.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

**1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.



## **PART 2 - PRODUCTS**

### **2.1 AIR COOLED PACKAGED UNITS**

- A. Ship units in a single package configuration fully piped, charged and wired ready for mounting on a prefabricated curb supplied by the manufacturer. Test unit at factory, including the compressors, air handling and operating and safety controls. Include a factory mounted disconnect switch for single point electrical power connection.
- B. Casing and Base
1. Fabricate casing of 18 gauge hot-dipped galvanized minimized spangle sheet steel ASTM A525. Insulate the casing with one inch thick 2#/ft.3 density glass fiber insulation attached with adhesive and mechanical fasteners.
  2. Paint the external surface with a three-step procedure. Clean, prime, finish coat with Gray Enamel.
  3. Construct the structural base of 10 gauge hot-dipped galvanized steel shaped to provide a minimum 2- $\frac{3}{4}$ " of integral counterflashing over the entire outside perimeter of a roof mounting curb. Cabinet framing and supports shall be at least 14 gauge galvanized steel and shall provide sufficient rigidity for top-handling through eye-bolts without the use of on-site "spreader-bars". Outer casing shall over-lap the base frame at all surfaces to provide weather-tight flashing and shall be attached with gasketed mechanical fasteners. These fasteners shall be field-removable using simple hand tools.
  4. Support panels from within by structural members and shaped to drain water to the outer edge for run-off.
  5. Equip all major sections and/or accessories with matching external flanges provided with natural rubber gasketing material. Job site attachment of sections shall be with  $\frac{1}{4}$ " - 20 bolts, nuts and neoprene seal-washers provided by the equipment manufacturer and installed through pre-drilled matching holes in the connecting flanges. Base frames shall have heavy-gauge "bolt-tabs" so that sections may be pulled tightly together without the use of pipe-clamps or related equipment by the installer.
  6. Provide access doors at controls, fan, evaporator and filter service areas. These doors shall seat in a wide gasketed 'U' - channel and shall be readily removable without the use of any tool.
- C. Blower Sections
1. Provide main blowers mounted on a solid shaft designed to hold the first critical speed of the system well above the maximum operating speed. Wheels shall be statically and dynamically balanced to assure quiet, trouble-free operation. Equip all units with belt drives sized at 150% of required horsepower and an adjustable motor sheave to allow field changing of blower speed to meet the exact system resistance. Rotating blower components shall be rubber-isolated from the unit structure.



D. Evaporator Section

1. Construct the evaporator coil of seamless ½" copper tubes expanded into aluminum plates with adequate area to provide for a low face velocity. Provide thermostatic expansion valves with adjustable superheat and external equalizer. All components shall be easily accessible for inspection without use of tools.

E. Condenser Section

1. Enclose all wiring external to the condenser control panel in weatherproof jacketed conduit or cable.
2. Provide semi-hermetic compressors, suction cooled and equipped with service valves and crankcase heaters. The condenser coils shall have 12 fins or less per inch and shall be sized to allow the unit to operate at low condensing temperature. Equip the unit with a hot gas by-pass system to allow the system to modulate at the demand of the evaporator load. The condenser shall have multiple fans direct driven to avoid the necessity for bearings, pulleys, shaft or belt replacement. The condenser fan motors shall be three-phase, suitable for outdoor operation with internal overload protection. One or more of these motors shall be controlled by head pressure allowing the unit to operate at 45°F or high ambient temperature. The condenser fan section shall be internally partitioned to prevent short circuiting of air and windmilling during low ambient operation. The compressors shall be spring-mounted and equipped with an oil pressure switch, high and low-pressure switches, crankcase heater, suction and discharge vibration isolators. The main power connection shall be to a weatherproof disconnect switch.

F. Refrigerant Circuit

1. The refrigeration circuit shall be leak tested, vacuum de-hydrated, and include a full operating charge of refrigerant-. Individual operating test data is to accompany the equipment. The system shall be close-coupled such that the compressors are located within twelve (12) feet of the evaporator. Control devices shall include a manual liquid line shut-off valve, moisture indicating sight-glass, filter-drier, solenoid valve, expansion valve, and venturi-type distributor. The hot gas bypass line is to be equipped with a solenoid valve and suction-pressure-regulated bypass control. Hot gas bypass is to flow through the evaporator thereby maintaining refrigerant velocity and oil return.

G. Heating Section - Gas Fired

1. The heater shall have multiple flue passes. The primary heating surface shall be 16 gauge, 430 stainless steel with the combustion chamber in the shape of a true cylinder. The flue gases shall pass through a one pass tubular economizer of secondary heating surface. The tubular economizer shall be equipped with turbulators. All economizer tubes shall be accessible for cleaning through an external access panel. This access shall be located on the same side as the burner and induced draft fan.
2. The power gas burner shall be factory mounted and wired. It shall be equipped with high tension spark ignited gas pilot, electronic primary safety control, automatic gas control valve, main gas regulator, pilot gas regulator, pilot gas cock, pilot assembly, and all components necessary to make a complete unitary burner assembly. The burner shall be designed for use with the particular furnace, to provide one responsibility for overall performance.



3. The gas burner shall be equipped for controlled two-stage, high-low-off firing, including two stage controller, two position damper motor, gas metering valve, proportioning air damper, and necessary linkage to assure proper air-fuel ratio at all rates. All components of the burner shall be mounted, wired and fire tested prior to shipment from the manufacturer.
  4. The gas burner shall be equipped for modulated firing including modulating controller, modulating damper motor, gas metering valve, proportioning air damper and necessary linkage to assure proper air-fuel ratio at all rates. All components of the burner to be mounted, wired and fire tested prior to shipment from the manufacturer.
- H. Heater Section - Hot Water
1. The heater element shall be a hot water coil. The tubing shall be seamless copper with fins securely bonded in position by tubing expansion. Capacity shall be as scheduled.
- I. Induced Draft Fan
1. Provide a direct drive induced draft fan driven by a self-ventilating motor and controlled separately from main blowers. Install so as to draw cooling air over inboard motor bearing and shaft. Fan shall discharge into a stack to carry all flue gas away from the unit.
- J. Filter Section
1. The filter section shall have four-inch, 40% ASHRAE efficiency, throw away filters and shall be easily accessible for cleaning.
- K. Economizer Section
1. Economizer controls shall operate the Outside Air/Return Air dampers at the demand of the Logic Panel. Outside air dampers shall remain at the minimum position selected at the unit panel, manual potentiometer during heating operation. Cooling operation shall drive the outside air dampers to the fully open "Economizer" position for free cooling whenever the outside air temperature and humidity are suitable for Economizer operation. An adjustable outside air enthalpy control shall drive the outside air dampers to the minimum position when "free cooling" is no longer available from outside ambient conditions.
- L. Provide main blowers of multiple fans mounted on a solid shaft designed to hold the first critical speed of the system well above the maximum operating speed. Wheels shall be statically and dynamically balanced to assure quiet, trouble-free operation. Equip all units with belt drives sized at 150% of required horsepower and an adjustable motor sheave to allow field changing of blower speed to meet the exact system resistance. Rotating blower components shall be rubber-isolated from the unit structure.



M. Controls

1. Provide a low voltage room thermostat (equipped with "Heat-Cool" and "Auto-Off-Fan" switches) to operate the heater, fans, and condensing unit through a solid-state Logic Panel. As space temperature falls below set-point, (heating) the Logic Panel balances the space temperature signal against the signal from a discharge air temperature sensor and energizes the minimum amount of heating required for the load. Outside air dampers (on units with Economizer Controls) are positioned at the minimum ventilation position during the heating season for maximum economy. As space temperature rises above set-point (cooling), the Logic Panel balances the space and discharge sensor signals by first opening the outside air damper (on units with Economizer Controls) for free cooling. Additional cooling load is satisfied by energizing one or more stages of the condenser/evaporator.
  - a. Multiple compressors and/or cylinder unloaders shall be controlled by load demand circuitry which is integral with the logic panel. Cooling output is controlled at the minimum level required to satisfy the load.
2. A System Master remote control panel containing "System: On-Off", "Heat-Auto-Cool" selector switches, and indicating lights for "Heat", "Cool", "Fan", "heat Fail", and "Cool Fail" shall be provided for each unit. A Solid State Central Processor shall operate the heating, cooling, and economizer dampers to maintain space temperatures. The Central Processor shall respond only to the load signals from the zone of greatest heating demand and the zone of greatest cooling demand and shall maintain the minimum temperature difference required to satisfy the zones of maximum demand. Primary heat shall be available only with the selector switch in the "heat" or "Auto" positions; mechanical cooling is locked out in the "Heat" position. When the selector is in the "Auto" position, both heating and cooling shall be available at the demand of the zone thermostats. With the selector switch in the "Cool" position, the primary heat shall be locked out, and the zones will be supplied with cooling or with bypassed return air as determined by individual zone stat demand. The Central Processor shall operate the economizer dampers to satisfy any cooling demand with "free cooling" from outside air before energizing any steps of mechanical cooling. A cooling coil "freeze protection" control shall de-energize the condenser in the event of coil frosting or low air flow. Cooling capacity control shall be provided by a hot gas bypass control modulating to maintain constant evaporator suction pressure, and by steps of cylinder unloading.
3. The temperature controls and actuators shall be by the Automatic Temperature Controls Contractor.

**2.2 HEATING ONLY UNITS**

A. Casing

1. Fabricate the casing of 18 gauge hot-dipped galvanized minimized spangle sheet steel ASTM A525. The casing shall be insulated with one inch thick 2#/ft.3 density glass fiber insulation attached with adhesive and mechanical fasteners. The external surface is painted with the following three step procedure. Clean & wash-prime with #4040/4041; prime-paint with #8039-C phenolic; paint with medium blue acrylic enamel.



**B. Structure**

1. Structural base shall be of 10 gauge hot-dipped galvanized steel shaped to provide a minimum 2 $\frac{3}{4}$ " of integral counter flashing over the entire outside perimeter of a roof mounting curb. Cabinet framing and supports shall be at least 14 gauge galvanized steel and shall provide sufficient rigidity for top-handling through eye-bolts without the use of on-site "spreader-bars". Outer casing shall over-lap the base frame at all surfaces to provide weather-tight flashing and shall be attached with gasketed mechanical fasteners. These fasteners shall be field-removable using simple hand tools. Top panels shall be supported from within by structural members and shall be so shaped as to drain water to the outer edge for run-off.
2. All major sections and/or accessories are to be equipped with matching external flanges provided with natural rubber gasketing material. Job site attachment of sections shall be with  $\frac{1}{4}$ " - 20 bolts, nuts and neoprene seal-washers provided by the equipment manufacturer and installed through pre-drilled matching holes in the connecting flanges. Base frames shall have heavy-gauge "bolt-tabs" so that sections may be pulled tightly together without the use of pipe-clamps or related equipment by the installed.
3. Provide access doors at burner, controls, fan, and filter service areas. These doors shall be readily removable without the use of any tool.

**C. Heater Section – Hot Water**

1. The heater element shall be a hot water coil. The tubing shall be  $\frac{1}{2}$ " O.D. seamless copper with fins securely bonded in position by tubing expansion. Capacity to be as scheduled.

**D. Heating Section – Gas Fired**

1. The heater shall have multiple flue passes. The primary heating surface shall be 16 gauge, 430 stainless steel with the combustion chamber in the shape of a true cylinder. The flue gases shall pass through a one pass tubular economizer of secondary heating surface. The tubular economizer shall be equipped with turbulators. All economizer tubes shall be accessible for cleaning through an external access panel. This access shall be located on the same side as the burner and induced draft fan.
2. The power gas burner shall be factory mounted and wired. It shall be equipped with high tension spark ignited gas pilot, electronic primary safety control, automatic gas control valve, main gas regulator, pilot gas regulator, pilot gas cock, pilot assembly, and all components necessary to make a complete unitary burner assembly. The burner shall be designed for use with the particular furnace, to provide one responsibility for overall performance.
3. The gas burner shall be equipped for controlled two-stage, high-low-off firing, including two-stage controller, two position damper motor, gas metering valve, proportioning air damper, and necessary linkage to assure proper air-fuel ratio at all rates. All components of the burner shall be mounted, wired and fire tested prior to shipment from the manufacturer.



4. The gas burner shall be equipped for modulated firing including modulating controller, modulating damper motor, gas metering valve, proportioning air damper and necessary linkage to assure proper air-fuel ratio at all rates. All components of the burner to be mounted, wired and fire tested prior to shipment from the manufacturer.

**E. Induced Draft Fan**

1. Provide a direct drive induced draft fan shall be direct driven by single purpose self-ventilating motor and controlled separately from main blowers. The design shall be such that cooling air is drawn over the inboard motor bearing and shaft. The blower shall discharge into a stack to carry all flue gas away from the unit.

**F. Blower Section**

1. Main blowers shall be multiple toward curved centrifugal fans mounted on a solid shaft designed to hold the first critical speed of the system well above the maximum operating speed. Wheels shall be statically and dynamically balanced to assure quiet, trouble-free operation. All units shall be equipped with belt drives sized at 150% of required horsepower and an adjustable motor sheave to allow field changing of blower speed to meet the exact system resistance. Rotating blower components shall be rubber-isolated from the unit structure.

**G. Filter Section**

1. The filter section shall have two-inch permanent high velocity type filters and shall be easily accessible for cleaning.

**2.3 MANUFACTURERS**

- A. AAON
- B. Trane
- C. Carrier
- D. Annexair
- E. Or approved equal

**PART 3 - EXECUTION**

**3.1 NOT USED**

**END OF SECTION 23 62 20**



**Department of  
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Construction**

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**SECTION 23 73 00  
FACTORY ASSEMBLED AIR HANDLING UNITS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide factory assembled air handling units in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Indoor Units.
- B. Rooftop Units.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Manufacturer's Data: Submit certified dimensioned drawings, including total weight and support points.
- C. Product Data: Submit fan curves, coil performance and acoustic data for each unit.
- D. The City of NY and Commissioner may observe the air handling units for this Project under manufacture at the factory prior to shipment, if they so desire. The Contractor shall notify all in writing of the production schedule and shipment date at least three (3) weeks prior to the first air handling unit production date.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Construct units in compliance with all requirements of the latest edition of the Air Movement and Control Association's (AMCA) certified rating standards for air moving equipment.



- C. Test, rate and certify units' performance and characteristics, including cooling and heating coils, in accordance with the Air Conditioning and Refrigeration Institute (ARI).
- D. Provide U.L. listed electric heating coils.
- E. All insulation shall have a composite (insulation, facing, and adhesive) fire and smoke hazard rating as tested by Procedure ASTM E84, NFPA 255, and UL 723 not exceeding:
  - 1. Flame Spread 25
  - 2. Smoke Developed 50
- F. Sound Ratings: Construct each air handling unit to operate for all conditions of the air flow (including units serving variable air volume systems from 100 to 15% air flow) for installation in sound environment as specified in the Specification Section 23 05 40 "Acoustics". Achieve sound rating required for the completed installation with the air handling unit designed, constructed and installed to comply with the sound power level listed hereinafter with the room construction as indicated on the Architectural and Structural Drawings, for this Project and with the ductwork and vibration isolation Specifications and as indicated on the Mechanical Drawings and in these Specifications.
- G. In order to establish centrifugal fan test curves, test each type of unit in accordance with ARI Standard 430-66.
- H. In order to establish axial fan test curves, test each type of unit in accordance with AMCA Standard 210-85, or the International Standards Organization, Reference BS-848-1980.
- I. Conform all fan drives to industry standard tolerances as set forth in "Engineering Standards for Multiple V-Belt Drives-1972" as adopted by the Mechanical Power Transmission Association and the Rubber Manufacturers Association, Inc.

## 1.5 GUARANTEE

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Provide factory-built air handling units for indoor rooftop use, of the horizontal or vertical type with coil requirements and capacities as listed on the Drawings. Air handling unit types, as designated on the Drawings, are as follows:
  - 1. Centrifugal Blow-Through: In the Schedule this type of air handling unit is marked "CBT".



2. Centrifugal Draw-Through: In the Schedule this type of air handling unit is marked "CHDT" (horizontal) or "CVDT" (vertical).
  3. Axial Blow-Through: In the Schedule this type of air handling unit is marked "ABT".
  4. Axial Draw-Through: In the Schedule this type of air handling unit is marked "AHDT" (horizontal) or "AVDT" (vertical).
  5. Rooftop unit: in the schedule this type of air handling unit is marked "RTDT".
- B. Construct each air handling unit complete with casings, fans, internal spring type vibration isolation, insulation, drain pans, heating coils, cooling coils, galvanized or painted filter retainer frames or plenums for filter holding frames and media as specified in herein, factory mounted fan motors with adjustable bases, belt guards, and belt drives. The actuators for fans with inlet vanes will be electric or electronic type and will be supplied under specification section 23 09 23 Building Management and Control System (BMCS). Responsible subcontractor will factory or field install, hookup and calibrate the actuator with linkage.

## 2.2 UNIT CASINGS (INDOOR UNITS)

- A. Construct casings of minimum 16 gauge G90-U galvanized steel structural frames and minimum 2-inch-thick double-wall panels. Construct double wall panels of minimum 18 gauge G90-U galvanized steel exterior panels and minimum 20 gauge perforated solid G90-U galvanized steel interior panels. In order to properly clean the interior of the air handler of microbial growth and other debris, the casings shall be constructed such that structural frames are free standing and double wall panels are non-load bearing. Provide connection flanges and all other framework that is needed on unit to ensure that removal of double wall panels shall not affect structural integrity of unit.
- B. Construct casing sections located upstream of supply fan for operation at 4 inches water gage negative static pressure and casing sections located downstream of supply fan for operation at 6 inches water gage positive static pressure. Seal joints between casing sections with closed-cell foam gasketing for leak seal and thermal and acoustical break.
- C. Panels shall be fully removable to allow for a proper way to thoroughly clean panels of microbial growth and to access internal parts. Secure panels to structural frames with zincchromated plated screws. Seal joints between exterior panels and structural frames with closed-cell foam gasketing for leak seal and thermal and acoustical break.
- D. Casings not constructed of G90-U galvanized steel, casings with welds on exterior surfaces, or casings with welds on interior surfaces that have burned through to exterior surfaces shall be chemically cleaned, coated with rust inhibiting primer, and finished with rust inhibiting enamel in order to prevent premature corrosion and microbial growth.
- E. Casing shall have removable access panels access doors. Construct access doors of minimum 18 gauge G90-U galvanized steel exterior panels and minimum 22 gauge perforated solid G90-U galvanized steel interior panels. Provide automotive style gasketing around full perimeter of access doors to prevent air leakage. Provide non-corrosive alloy latches operable from the inside or outside of unit. If access doors do not open against unit operating pressure, provide safety latches that allow access doors to partially open after first



handle movement and fully open after second handle movement. Insulate access doors with 2-inch-thick 1½ 3 pound per cubic foot density matt faced fiber glass insulation.

- F. Insulate casing sections with 2-inch-thick 1½ pound per cubic foot density matt faced fiber glass insulation. Provide double wall casing construction and encase insulation between exterior and interior casing panels such that no insulation is exposed to airstream. Foil facing on insulation is not acceptable as alternate to double wall construction. Insulate all structural channels connected to casing panels and cover openings in structural channels with galvanized steel. Insulation shall comply with NFPA 90A.
- G. Insulate plug fan sections and discharge plenums with 4-inch-thick 1½ pound per cubic foot density matt faced fiber glass insulation to attenuate high frequency sound. Provide double wall casing construction and encase insulation between solid exterior and perforated interior, casing panels such that no insulation is exposed to airstream. Foil facing on insulation is not acceptable as alternate to double wall construction. Insulate all structural channels connected to casing panels and over openings in structural channels with galvanized steel. Insulation shall comply with NFPA 90A.
- H. Provide sealed double wall drain pans constructed of minimum 18 gauge G90-U galvanized steel exterior pans and minimum 18 gauge G90-U galvanized steel 304 stainless steel interior pans. Encase manufacturer's standard insulation between exterior and interior walls. Drain pans shall be sloped in 2 planes; cross break interior pans and pitch toward drain connection to ensure complete condensate drainage. Drain pan shall be coated with anti-microbial agent that prevent microbes from growing on the drain pan. Units with cooling coils shall have drain pans under complete cooling coil section and horizontal draw-thru units shall have drain pans under complete fan section. All drain pan connections will be to the side of the unit to enable proper trapping.

### **2.3 UNIT CASING (ROOFTOP UNITS)**

- A. Unit shall be designed and built specifically for outdoor installation. Weatherized indoor air handlers are not acceptable. Unit casing shall be leakproof up to three-inch negative static pressure. All exterior wall panels shall be made of no less than 16-gauge galvanized steel welded to a 10-gauge welded galvanized steel base channel. All seams shall be welded or bolted and sealed with a rubber based mastic. External vertical seams shall be covered with a "U" clip, welded in place for additional weather protection. Use of sheet metal screws to fasten side walls to unit framework is not permitted. Entire floor of unit shall be insulated in a manner so that interior floor of unit is all galvanized, thus preventing insulation erosion into the airstream.
- B. Galvanized roof shall be pitched for drainage and shall overlap the side panel on all four sides. The roof shall be gasketed and secured to the wall panels with zinc coated steel screws. Roof panel section joints shall be gasketed and bolted together, with a 'C' clip over panel joints for additional weather protection. Roof panels shall be insulated in a manner so that ceiling of unit is all galvanized thus preventing insulation erosion into the airstream.
- C. All exterior surfaces of unit shall be finished with vinyl chlorinated lacquer over photophastized galvanized steel for corrosion protection. Paint colors other than the manufacturer's standard color shall match the paint chip furnished by the Commissioner.
- D. Unit shall have an insulated galvanized drain pan extending under coil and fan/motor assembly for leak protection. An insulated 'P' trap shall be provided by the manufacturer to provide proper condensate drainage.



- E. Access doors shall be double wall constructed with insulation sandwiched between the door and a 16-gauge galvanized steel panel.
- F. Unit shall be provided with insulation retainers around door frames to prevent incidental damage to insulation when entering unit through the access doors.
- G. Air handling units shall be furnished with a nameplate which includes the model number, serial number and unit tag number.
- H. Pipe cabinet for heating and cooling coils shall be an internal part of the unit casing, in order to permit coils to be piped inside the unit roof curb and outside the airstream. It is not acceptable for piping to penetrate the floor of the air handler in the airstream due to possibility of moisture carryover creating leaking problems.
- I. Pipe cabinet for heating and cooling coils shall be external from unit casing. Pipe chase cabinet shall be factory assembled, and shall be constructed and insulated the same as the unit casing. External cabinet shall be field installed after piping of coils, on a separate roof curb. External pipe cabinet shall have a separate access door of the same construction as the unit casing doors. It is not acceptable for piping to penetrate the floor of the air handler in the airstream due to possibility of moisture carryover creating leaking problems.
- J. Unit shall be double wall construction to prevent fiberglass erosion into the airstream. Double wall shall be minimum of 22-gauge galvanized steel. Foil faced insulation is not acceptable.

#### **2.4 FANS**

- A. Provide fan section(s) with BI double width, double inlet centrifugal fan designed and suitable for class of service indicated in the unit schedule. Fan shaft to be properly sized and protectively coated with lubricating oil. Fan shafts shall be solid and properly designed so that fan shaft does not pass through first critical speed as unit comes up to rated RPM. Fans shall be statically and dynamically tested as an assembly at the required RPM to meet design specifications. Key fan wheels to fan shaft to prevent slipping.
- B. Provide fan sections with AF single width, single inlet centrifugal plug fans designed and suitable for class of service indicated on unit schedule. Fan shaft to be properly sized and protectively coated with lubricating oil. Fan shafts shall be coiled and properly designed so that fan shaft does not pass through first critical speed as unit comes up to rated RPM. Fans shall be statically and dynamically tested as an assembly at the required RPM to meet design specifications. Key fan wheels to shaft to prevent slipping.
- C. Provide self-aligning, grease lubricated pillow-block ball bearings selected for L-50 200,000-hour average life per ANSI/AFBMA 9. Extend grease lubrication fittings to drive side of unit with plastic tubes and zerk fittings rigidly attached to casing.
- D. Equip centrifugal plug fans with self-aligning, grease lubricated ball bearings selected for L-50 400,000-hour average life per ANSI/AFBMA 9. Extend grease lubrication fittings to drive side of unit with plastic tubes and zerk fittings rigidly attached to casing.
- E. Provide variable inlet vanes for fans as scheduled on drawings. Actuators to be provided under specification section 23 09 23 Building Management and Control System (BMCS).



1. FC fans: Operate inlet vanes by aluminum center rotating ball bearing hub located out of fan inlet. Construct inlet vanes of minimum 14 gauge steel, welded to vane rods and plated to prevent corrosion. Form inlet vanes to fit circumference of inlet orifice. Offset vane rods for rotation out of fan inlet.
  2. AF fans: Operate inlet vanes by steel center, roller bearing, direct link hub. Construct inlet vanes of minimum 14 gauge galvanized steel. Inlet vanes shall rotate about vane rods. Form inlet vanes to fit circumference of inlet cone.
  3. AF plug fans: Operate inlet vanes by cast iron center, cam follower bearing, direct link hub. Construct inlet vanes of minimum 14 gauge steel, welded to van rods and plated to prevent corrosion. Form inlet vanes to fit circumference of inlet cone.
  4. BI fans: 20 inches and larger shall be operated by a steel center, roller bearing, direct link hub. Inlet vanes shall be 14-gauge galvanized steel, rotated about the vanes and have edges formed to fit the circumference of the inlet cone. For BI fans 18" and smaller, provide external inlet vanes with a peripheral drive.
- F. Mount fans on minimum 16 gauge steel isolation bases. Internally mount motors on same isolation bases and internally isolate fans with housed spring seismic isolators. Install flexible canvas ducts between fan and casings to ensure proper isolation and prevent vibration and noise from being transmitted through the unit and ductwork. Flexible canvas ducts shall comply with NFPA 90A. If no flexible canvas duct is provided, then the entire unit shall be externally isolated from the supply duct work and piping by contractor.
- G. Fan sections shall have full height, double wall, hinged, removable access doors on both sides for inspection and maintenance of internal components. To facilitate inspection of internal components, provide 8 x 10-inch sealed glass and wire view windows on access doors. Provide marine lights inside fan sections. Construct marine lights of sealed glass fixtures with wire guards to keep electrical sockets dry and protect fixtures from damage.
- H. Fan sections of 16,000 cfm or more shall have totally enclosed belt guards. Construct belt guards of galvanized expanded metal to allow viewing of belt tension. Belt guards shall have removable front and top panels and tach holes opposite fan and motor shafts.
- I. Fan sections with plug fans shall have galvanized expanded metal access door guards to prevent unauthorized entry into fan sections when access doors are opened. Install access door guards for removal from outside of unit.
- J. Statically and dynamically balance fan section assemblies. Fan section assemblies include fan wheels, shafts bearings, drives, belts, isolation bases and isolators. Allow isolators to free float when performing fan balance. Measure vibration at each fan shaft bearing in horizontal, vertical and axial directions. Balance at design RPM's as scheduled on drawings. For fan sections controlled by variable frequency drives, balance at all speeds between 25% and 100% of design RPM.

## **2.5 MOTORS AND DRIVES**

- A. Factory install all motors on slide base to permit adjustment of belt tension.



- B. Fan motors shall be heavy duty.
- C. V-Belt Drive shall be variable pitch rated at 1.5 times the motor nameplate.
- D. Manufacturer shall provide replacement pulleys as required at time of air balancing for field replacement at no additional cost.
- E. Provide variable frequency drive and matching motors as specified in the specification section 23 85 00, Variable Frequency Controllers.
- F. Mount motors for rooftop units inside the unit casing.
- G. Motors shall be selected so that they will not overload if the static pressure drops one-quarter inch below the specified value listed in the "Schedule of Capacities". Motors shall be mounted on the coil connection side unless indicated otherwise on the Drawings. Each motor shall be factory mounted on an adjustable base rigidly supported to the fan base. Motor shall have an extended shaft to accommodate the adjustable pitch motor sheave specified herein. See the Section 23 86 00 "Electric Motors Controllers" for motor specifications.
- H. All motors operated on variable frequency drives shall be equipped with maintenance free, conductive micro fiber, shaft grounding ring with a minimum of two rows of circumferential micro fibers to discharge damaging shaft voltages away from bearings to ground. Shaft grounding ring to be installed as per manufacturer's recommendation.

## **2.6 COILS**

### **A. General**

- 1. Install coils such that headers and return bends are enclosed by unit casings.
- 2. Construct coils of configuration plate fins and seamless tubes. Fins shall have collars drawn, belled and firmly bonded to tubes by means of mechanical expansion of tubes. Do not use soldering or tinning in bonding process.
- 3. Construct coil casings of minimum 16 gauge galvanized steel with formed end supports and top and bottom channels. If two or more coils are stacked in unit, install intermediate drain channels between coils to drain condensate to main drain pans without flooding lower coils or passing condensate through airstream.

### **B. Water Cooling and Heating Coils**

- 1. Clearly label supply and return headers on outside of units such that direction of coil water-flow is counter to direction of unit air-flow.
- 2. Coils shall be proof tested to 300 psig and leak tested to 200 psig air pressure under water.
- 3. Construct headers of round copper pipe or case iron.



4. Construct tubes of ½ inch O.D. copper and construct fins of aluminum.

**C. Refrigerant Cooling Coils**

1. Clearly label suction and liquid connections on outside of units.
2. Proof test coils to 450 psig air under water and leak test coils to 300 psig air pressure under water. Dry insides of coils after testing and seal all connections.
3. Construct suction headers of copper tubing. Suction connections shall penetrate until casings to allow for sweat connections to refrigerant lines.
4. Coils shall have equalizing type vertical distributors sized in conjunction with capacities of coils.
5. Heaters will be supplied with the following special constructions:
  - a. Weatherproof construction (on outdoor units).
  - b. Dust-tight terminal box.
  - c. NEMA 12 terminal box.
  - d. Insulated terminal box.
  - e. Insulated frames.
  - f. To fit air handling unit.
6. Heaters will be supplied with the following control circuit Special Features:
  - a. Disconnect switch.
  - b. Panelboard mounted controls.
  - c. Fuses for heaters rated 48 amps or less.
  - d. Disconnecting contactors with pilot switches.
  - e. Pilot lights to indicate:
    - 1) Low airflow and power on
    - 2) Each stage on
  - f. Fan relay.
  - g. Automatic heater demand control.



## 2.7 FILTERS

- A. Provide factory fabricated filter section of the same construction and finish as unit casings. Filter sections shall have filter guides and full height, double wall, hinged, removable access doors for filter removal. Filter sections shall flange to other unit components. Provide filter blockoffs as required to prevent air bypass around filters.
- B. Provide 2-inch angled filters with maximum face velocity of 500 feet per minute with pleated media filters. Filters shall be coated with an anti-microbial coating to prevent microbes from growing in the filters. Filters shall be removable from both side(s) of filter sections.
- C. Provide high efficiency filter sections with maximum face velocity of 500 feet per minute with cartridge filters and disposable panel pre-filters. Bag filters shall be minimum 30" deep with 25 sq. ft. of media per sq. ft. of face area in order to provide proper filtration. High efficiency filters shall be 95% efficient and rated in accordance with ASHRAE 52 and UL Class 1 or Class 2. Filters shall be coated with an anti-microbial coating to prevent microbes from growing in the filters. Filters shall be removable from both sides of filter sections.
- D. Provide HEPA filter section with maximum face velocity of 500 feet per minute with HEPA filters. HEPA filter section shall have zero bypass. HEPA filters shall be 99.97% efficient when tested with 0.3 micron thermally generated particulates. Filters shall be removable from both sides of filter sections.
- E. Provide filters which are designed for removal of gas phase contaminants. Particulate pre-filters should have an ASHRAE efficiency of 25% or greater and shall be treated with a proven anti-microbial agent. Gas phase filters can use various medias to remove ozone, formaldehyde, and volatile organic compounds at room temperature. Ozone, formaldehyde, and volatile organic compounds shall be removed with a first pass efficiency as follows:
- |                               |     |
|-------------------------------|-----|
| 1. Ozone                      | 40% |
| 2. Formaldehyde               | 15% |
| 3. Volatile Organic Compounds | 20% |
- F. Gas phase filtration systems using an activated carbon or potassium permanganate media must have face velocities of 50-80 feet per minute in order to properly remove the volatile organic compounds. Contractor will be responsible to off filters once every month throughout the guarantee period to ensure minimal bypass through filter.

## 2.8 DAMPERS

- A. Provide all internally mounted dampers as scheduled on drawings. Dampers shall be double skin airfoil design or equivalent. Construct damper blades of minimum 14 gauge galvanized steel and damper frames of minimum 16 gauge galvanized steel. Provide opposed blade action with metal compressible jamb seals and extruded vinyl blade edge seals. Blades shall rotate on stainless steel sleeve bearings. Damper blade lengths shall not exceed 60 inches. Leakage rate shall not exceed 8 CFM/square foot at one-inch water gage and 12 CFM/square foot at 4 inches water gage.



- B. Provide face and bypass dampers as scheduled on drawings. Dampers shall be double skin airfoil design or equivalent. Construct damper blades of minimum 14 gauge galvanized steel and damper frames of minimum 16 gauge galvanized steel. Provide opposed blade action with metal compressible jamb seals and extruded vinyl blade edge seals. Blades shall rotate on stainless steel sleeve bearings. Mechanically link face dampers to bypass dampers and provide end driven control shafts. Damper blade lengths shall not exceed 60 inches. Leakage rate shall not exceed 8 CFM/square foot at one-inch water gage and 12 CFM/square foot at 4-inch water gauge.
- C. Multi-zone dampers shall be double skin airfoil design or equivalent. Construct damper blades of minimum 14 gauge galvanized steel and damper frames of minimum 16 gauge galvanized steel. Dampers shall have metal compressible jamb seals and extruded vinyl blade edge seals. Blades shall rotate on stainless steel sleeve bearings. leakage rate shall not exceed 11 CFM/square foot at one-inch water gage.
- D. For each damper, provide mounting bracket. Each damper shall also have an extended shaft to mount the damper actuator linkage.

## **2.9 ACCESS SECTIONS**

- A. Provide access sections between all coil sections and between filter section and electric heating coil and as shown on drawings. Access sections shall have double wall, hinged, removable access doors on both side(s) of sections. To facilitate inspection of internal components, provide 8 x 10 inch sealed glass and wire view windows on access doors.
- B. Construct access sections such that access may be obtained to internal components through any access panel. Construct panels of minimum 18 gauge galvanized steel. In order to properly clean the interior of the air handle of microbial growth and other debris, the casings shall be constructed such that structural frames are free standing and double wall panels are non-load bearing. Contractor shall be responsible to provide connection flanges and all other framework that is needed on unit to ensure that removal of double wall panels shall not affect structural integrity of unit.

## **2.10 ELECTRICAL**

- A. Fan motor shall be wired through electrical conduit to a weatherproof junction box on the inside front wall of the fan section. A short piece of liquid tight, flexible conduit shall be provided near the fan motor to allow for proper fan isolation.
- B. Unit fan section shall be provided with an overhead heavy-duty light supported from the ceiling. Unit light shall be wired through electrical conduit to a weatherproof junction box, located near the motor electrical wiring junction box. The weatherproof box shall contain a weatherproof light switch and 115 volt convenience outlet. Units larger than eight feet in width must have two lights in the fan section, to permit viewing of supply fan bearing operations.
- C. Unit manufacturer shall provide a UL approved 3.3 kw unit heater, with a properly sized, weatherproof enclosed, circuit breaker. Unit heater and circuit breaker to ship separate for field installation. Unit manufacturer shall provide wiring from the installation location for the unit heater through electrical conduit, to a weatherproof junction box, located near the motor and light junction box. Unit heater should be designed



to operate whenever the supply air fan is shut off and when operating, should maintain a preset temperature in the supply fan section. This option shall include the motor wiring option and the light wiring option.

- D. The motor control center shall be supplied by the unit manufacturer. The motor control center shall be prewired and tested to assure field performance. Motor control center(s) shall be UL listed and meet New York City Electrical Code requirements for the application.
- E. The Motor Control Center shall consist of a cabinet containing a common panel on which is mounted a 120-volt industrial type magnetic starter, motor circuit protector, 120-volt transformer properly sized for starter, fan on/off/auto switch, and contacts to permit operation of unit heater.
- F. Motor circuit protector shall be magnetic trip, UL approved for motors with an "off/on" handle accessible from outside the enclosure. Continuous current ranges and adjustable trip ranges must meet NEC requirements for full load and locked rotor current. An adjustable instantaneous trip point shall be provided for fault protection without nuisance tripping. Handle shall be able to be padlocked in the "off" position.
- G. Motor starter shall have three ambient compensated bi-metal overload relays. Fan on/off/auto switch, shall be oil and watertight.
- H. MCC enclosure door shall have coin-operated latches and defeaters to ensure door cannot be opened without the defeater being deliberately voided.

#### **2.11 INLET HOOD**

- A. Inlet hood shall be provided with high performance since wave moisture eliminators. Eliminators shall prevent moisture carryover into unit casing and filter bank and shall be at least 2¼-inch in depth. If eliminators are not available from manufacturer, installing contractor must field supply and install them. Wire mesh bird screens are not acceptable for preventing moisture from entering the unit.

#### **2.12 LIFTING BRACKETS**

- A. Lifting brackets shall be factory installed on single piece units. Additional removable lifting brackets shall be provided by the manufacturer on single piece units if required by manufacturer's lifting requirements.
- B. Removable lifting brackets shall be provided by the manufacturer on multi-piece units to permit lifting of unit sections without slings.

#### **2.13 CURB**

- A. Curb shall be provided by the unit manufacturer. Curbs shall be constructed of galvanized steel and have a wood nailing strip factory installed. Joints, gasketing and bolts for assembly shall be provided as required. A pipe nipple for condensate drainage system shall be provided for each coil section. The unit condensate drainage system shall be properly trapped inside the unit roof curb to provide adequate condensate drainage at specified fan suction pressures. Curb design shall be such that the unit will be installed level.



**2.14 MANUFACTURERS**

- A. Carrier
- B. Trane
- C. AAON
- D. Annexair
- E. Or approved equal

**PART 3 - EXECUTION**

**3.1 NOT USED.**

**END OF SECTION 23 73 00**



**SECTION 23 73 05  
FANS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide centrifugal and axial fans in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Centrifugal Fans
  - 1. Scroll
  - 2. Cabinet
  - 3. Tubular Centrifugal
- B. Axial Fans
  - 1. Propeller
  - 2. Vaneaxial - Fixed Blade
  - 3. Vaneaxial - Adjustable Blade
- C. Roof Exhaust Fans.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's latest published data for dimensions, materials, accessories and installation details.



- C. Submit full technical rating data based on tests in accordance with current AMCA standards and in an AMCA approved laboratory. Include manufacturer's certified fan performance curves, and certified sound power ratings. Correct all ratings and curves for altitude and temperature where applicable.

#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Construct all fans, except vaneaxial adjustable blade, to comply with the requirements of the latest editions of the Air Moving and Conditioning Association (AMCA) Standards and Bulletins. Certify these fans by AMCA for performance ratings and provide the AMCA Performance and Construction Seal.
- C. Install fans, with their accessories, to comply with the recommendations of the New York City Mechanical and Building Code as well as the National Fire Protection Association (NFPA).

#### **1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.

### **PART 2 - PRODUCTS**

#### **2.1 GENERAL - ALL FANS**

- A. Unless noted otherwise, provide discharge direction and drive arrangement to suit space conditions and conform as closely as possible to the layouts shown on the Drawings.
- B. Provide fans that are quiet operating and non-overloading over the entire range of operation.
- C. Provide fan motors in accordance with section entitled "Electric Motors." Size motor to drive its respective fan when the fan is operating at a speed 5% in excess of that required to meet the scheduled fan performance. Do not select motors within the service factor for this range.
- D. Provide fan starters in accordance with section 23 86 00 13 "Motors Controllers" for installation by Division 26.
- E. Statically and dynamically balance fan wheels/impellers at the factory and so certify.
- F. Provide precision self-aligning bearings designed to prevent leakage of oil or grease. Provide cups, oil chambers, Zerk, Alemite, SKF or approved equal lubrication fittings in accessible locations for ease of lubrication. Provide heavy duty split pillow block bearings with tapered, double-row spherical roller assemblies. Provide bearings with service life in excess of 200,000 hours at maximum cataloged fan operating conditions.



- G. Provide copper lubrication leads, for lubrication of internal motors and bearings, extending to a capped termination point external to the fan casing.
- H. Extend wire leads on fans driven by direct motor drive from the motor in air tight rigid walled conduit, to a junction box mounted external to the fan casing.
- I. On fans driven by belt drive provide standard "V-groove" type belts and sheaves suitable for the service intended. Fan sheaves are non-adjustable type with removable machined bushings. Provide adjustable pitch type motor sheaves with double locking feature, to 10% above and below the rated fan speed. Dynamically balance sheaves with over three grooves. For fan motors over 10 horsepower, provide at least two belts. Design multiple belt drives capable of carrying the entire load with one belt broken. Provide preformed expanded metal or sheetmetal belt guards, with grommeted tachometer ports at the fan and motor shafts, for all exposed sheaves and belts.
- J. For motors in the airstream, provide TEAO or ODP type motors.
- K. Provide solid hot rolled steel drive shafts, accurately turned and polished to a close tolerance where in contact with bearings. Secure fan wheels/impellers to the drive shaft by a key and keyway assembly.
- L. Manufacture fans of materials and finishes suitable for the service intended.
- M. Construct wheels/impellers exposed to normal atmospheres of mild steel, hot dip galvanized, and finished with two layers of factory applied non-scaling paint.
- N. Construct fans exposed to corrosive atmospheres of corrosion resistant materials suitable for intended use, and factory finished with epoxy or other approved corrosion resistant coatings.
- O. Provide fans exposed to elevated temperatures with components rated for high temperature service. Do not use belt drive assemblies exposed to the airstream. Use direct drive motors certified for high temperature service.
- P. Construct fans used to convey flammable vapors of non-sparking (non-ferrous) materials, and use explosion proof motors.
- Q. Electrically ground fan and drive to prevent accumulation of static charge.
- R. Completely house fan assemblies exposed to weather in weatherproof enclosures including motor and drive.
- S. Fan wheels/impellers and casings shall be relieved of residual stresses produced in the forming process.
- T. Provide fans used to exhaust grease laden vapors with motor drive and bearings completely external of air stream.
- U. Provide housings with integral inlet and discharge flanges, complete with bolt holes for duct connections.
- V. Provide parallel vane pre-rotation vortex dampers at the fan inlet for variable volume control. Furnish and install all necessary linkages and accessories required for automatic control.



- W. Provide variable frequency drive as specified in section entitled "Adjustable Frequency Controllers."
- X. Provide gasketed access doors to permit routine maintenance and inspection of motor and internal components.

## **2.2 CENTRIFUGAL FANS**

### **A. Scroll Type**

1. Provide backward inclined (BI), backward curved (BC), airfoil (AF), forward curved (FC) fan wheels, and single width single inlet (SWSI), or double width double inlet (DWDI), as indicated on the Drawings, enclosed in a scroll shaped fan housing.
2. Weld or securely rivet fan blades to the hub plate and rim.
3. Rigidly build and brace curved scroll shaped housings with continuous welded seams and joints. Lockseam construction may be accepted for smaller fan sizes where it is standard construction for models listed on Drawings.

### **B. Tubular Type**

1. Provide backward inclined or airfoil fan wheels as indicated on the Drawings, in a cylindrical housing, with integral inlet venturi and airflow straightening vanes, arranged to impart unidirectional air flow.
2. Weld fan blades to the hub plate and rim. Backward inclined blades may be securely riveted to the hub plate and rim. Precisely cast aluminum fan wheels and machine finish.
3. Match the wheel inlet ring to a close tolerance with integral deep spun aerodynamic venturi inlets.
4. Provide radial air flow straightening vanes at the fan discharge.

### **C. Cabinet Type**

1. Provide scroll type centrifugal fans, factory installed within a cabinet enclosure, and comply with the requirements of Scroll Type Centrifugal Fans.
2. Internally isolate fan and motor assemblies from the cabinet.
3. Provide gasketed access doors and panels for inspection and routine maintenance of the internal components.
4. Provide solid state variable speed controllers for small ceiling mounted direct driven exhausters and transfer fans.



D. Manufacturers

1. Loren Cook
2. Barry Blower
3. Buffalo
4. Trane
5. Greenheck
6. Penn
7. Aerovent
8. Peerless
9. Or approved equal

**2.3 AXIAL FANS**

A. Propeller Type

1. Include propeller type impellers, complete with motors, and panel or ring mountings.
2. Vary fan blades in camber and twist from base to tip.
3. Construct impellers of die formed steel or aluminum attached to a central hub mounted on the fixed drive shaft.
4. Rotate fan hub on the fixed drive shaft using sealed ball bearings.
5. To eliminate overhang load on belted units, design to apply belt load to the hub in the same plane as the bearings.
6. Direct drive fans are acceptable where belt driven units do not meet the criteria.
7. Provide panels or rings with spun venturi inlets suitable for wall mounting and structural angle supports of welded steel construction.
8. Provide basket type fan guards for exposed inlets and discharges.
9. Manufacturers
  - a. Loren Cook
  - b. Greenheck



- c. Penn
- d. Aerovent
- e. Peerless
- f. Or approved equal

**B. Vaneaxial Fixed Blade Type**

1. Include impeller, motor, drive and cylindrical housing.
2. Construct fan blades, airfoil cross section, varying in camber and twist from base to tip, of die-formed steel or aluminum.
3. Fixed pitch fans shall have form impeller blades and hub in a single casting, or precision weld blades to the hub assembly.
4. Mount impeller directly on the drive shaft and secure in place with locking keyway assembly. Install motor and impeller to be removable from the inlet side of the fan.
5. Cross brace motor support base on direct drive fans to the fan housing for structural rigidity to prevent motor misalignment.
6. On belt drive fans protect belts and bearings from the airstream in an air insulated enclosure. Install to apply belt loads to the hub in the same plane as the bearings to eliminate overhang load.
7. Construct cylindrical fan housings of heavy gauge hot rolled steel with continuous weld seams.
8. Provide venturi inlet bell and discharge diffuser accessories of the same gauge and material as the fan housing.
9. Manufacturers
  - a. Trane
  - b. Greenheck
  - c. Penn
  - d. Aerovent
  - e. Peerless
  - f. Or approved equal



C. Vaneaxial Adjustable Blade Type

1. Include impeller and hub, guide vanes, motor, drive and cylindrical housing.
2. Construct fan blades of die-formed aluminum, sized for the fan diameter. Blades cut down from longer sections will not be acceptable. Provide double thickness blades with airfoil cross section and profile, varying in camber and twist, from base to tip.
3. Provide fans designated as adjustable pitch fans with blades which can be manually adjusted in the field. Provide pitch indicators at the base of each blade. Secure blades in place with set screws or locking adjustment nuts.
4. Provide fans designated as controllable pitch fans with in flight blade pitch modulation. Vary blade pitch through an external actuator furnished by the fan manufacturer with the fans connected via linkages to an internal, lubricated thrust bearing assembly, shall vary blade pitch in response to a command from the system air volume controller. Indicate blade angle on an external pitch index plate. Furnish and install all necessary linkages and accessories required for automatic control. Provide limit control set to the maximum allowable blade angle to prevent motor overload and burnout. Upon fan shutdown or power failure, pitch shall be reset to the minimum setting.
5. Mount impeller directly on the drive shaft and secure in place with locking keyway assembly. Install motor and impeller to be removable from the inlet side of the fan.
6. Provide an aerodynamic spinner cap over the hub face of impellers, to protect and conceal blade adjustment bearings.
7. Construct guide vanes of heavy gauge material and match the camber and twist of the impeller blades.
8. Cross brace motor support base and motor fairing on direct drive fans to the fan housing for structural rigidity to prevent motor misalignment.
9. On belt driven fans, protect belts and bearings from the airstream in an air insulated enclosure. Install to apply belt loads to the hub in the same plane as the bearings to eliminate overhang load.
10. Construct cylindrical fan housings of heavy gauge hot rolled steel with continuous weld seams.
11. Provide venturi inlet bell and discharge diffuser accessories of the same gauge and material as the fan housing.

D. Manufacturers

1. Woods
2. Flakt
3. Joy
4. Or approved equal



## 2.4 ROOF EXHAUST FANS

- A. Provide roof exhaust fans of the centrifugal, belt-driven type. Construct fan housing of heavy gauge aluminum.
- B. Construct all spun parts with a rolled bead for added rigidity and spun so as to seal the pores of the aluminum providing greater resistance against oxidation and deterioration.
- C. Provide all-aluminum fan wheel of the centrifugal blower type backward inclined blades and a tapered inlet shroud. Statically and dynamically balance wheels.
- D. Provide inlet cone of aluminum centrifugal blower type.
- E. Enclose motor and drives in a weather-tight compartment, separate from the airstream. Install to provide air for cooling the motor to the motor compartment by way of an air passage from an area free of contaminated exhaust fumes.
- F. Provide motors of the heavy duty, permanently lubricated, sealed ball bearing type. Size drives for 165% of motor horsepower capabilities and of the cast iron type, keyed to the fan and motor shafts. Provide variable pitch drives.
- G. Construct fan shaft of steel construction, turned, ground and polished to precise tolerances in relationship to the hub and bearings.
- H. Provide drive belts of the oil-resistant, non-static, non-sparking type with life expectancy of over 24,000 hours.
- I. Provide bearings flanged and of the permanently lubricated, permanently sealed, ball bearing type capable of over 200,000 hours bearing life.
- J. Design the entire drive assembly and wheel removable, as a complete unit, from the support structure without disassembling the external fan housing. Mount the complete drive assembly on rubber vibration isolation.
- K. Provide direct drive units of identical construction as belt drive units, except for drives, belts, and fan shaft bearings.
- L. Construct units of Type B construction and carry a one-year warranty.
- M. Construct all belt drive units requiring Type A construction, interior and exterior parts, including wheel, wheel hub, supporting posts, fan shaft, drive assembly, and all outside fasteners, of aluminum or non-ferrous material.
- N. Provide fans licensed to bear the AMCA ratings seal for air and sound performance.



- O. Manufacturers
  - 1. Loren Cook
  - 2. Greenheck
  - 3. Penn
  - 4. Aerovent
  - 5. Peerless
  - 6. Or approved equal

### **PART 3 - EXECUTION**

- 3.1 Install fans in accordance with manufacturer's recommendations and as shown on the Drawings. Follow SMACNA and AMCA recommended procedures for fan installations, belt guards, duct connections, etc.
- 3.2 Provide flexible connections as described in specification section 23 11 13 "Sheetmetal, Ductwork and Accessories" to provide sufficient separation of ductwork from fan assembly to prevent metal-to-metal contact.
- 3.3 Install fans and motors with proper support and vibration isolation as specified in section 23 05 48 "Vibration Isolation".
- 3.4 Provide sufficient clearances around fans for access and servicing of components. Install fans such that access doors, motors, belts, lubrication lines, electrical connections, etc. are readily accessible and not obstructed by other installations or structures.
- 3.5 Bump start fans to check that fan wheel/impeller rotation corresponds to the desired direction of air flow. Correct fans found to be rotating in a direction opposite to that desired.
- 3.6 Tighten belt drives, taking into account the service factor and any other design of the drive. Exercise care not to overtension belts.
- 3.7 Check all bolts and fasteners to ensure proper tightness. Do not overtighten nuts and bolts.
- 3.8 Check bearings and motor for proper lubrication, taking care not to overlubricate. Use only lubricants recommended by the manufacturer.
- 3.9 Provide a drain at the bottom of the housing for fans discharging upward from the roof. Pipe drains from housings of interior fans discharging directly up through the roof indirectly to a floor drain.

**END OF SECTION 23 73 05**



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**SECTION 23 84 40  
SPACE HEATING UNITS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide heating units in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Cabinet Heaters.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's latest information on construction details, capacity data and installation details.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. All electric heating units to be U.L. or ETL rated and bear certifying label.
- C. All hot water and steam units to be rated and tested for pressure as shown on the Drawings.

**PART 2 - PRODUCTS**

**2.1 UNIT HEATERS - PROPELLER FAN TYPE**

- A. Provide propeller type unit heaters with heating elements, motor driven propeller type fans, all installed in a metal casing, finished with lacquer or baked-on enamel.



- B. Motor speeds not to exceed 1,500 rpm. Remove and replace any unit heaters which are found to be objectionably noisy in the opinion of the Commissioner.
- C. Each unit heater to be properly supported from building construction and braced, as necessary, to prevent sway. Unit heaters shall not be supported by the piping to which they are connected.
- D. For wet heating systems, provide copper coil heating elements rated for maximum working pressure. Install an aquastat in the supply connection to each heater, wired to prevent the fan from operating when there is no heat available.
- E. For electric unit heaters, provide heating elements of sheathed nickel-chromium wire.

## **2.2 CABINET HEATERS - CENTRIFUGAL FAN TYPE**

- A. Provide cabinet heaters of type shown on the drawings.
- B. Heating elements for wet systems to be of nonferrous construction throughout, rated at maximum system working pressure.
- C. Heating elements for electric unit heaters to be sheathed nickel-chromium wires.
- D. Construct enclosures of the best grade furniture steel, rigidly braced throughout and fabricated of not less than 16 gauge steel on the back. Valves to be installed within the enclosure. Provide hand access doors for access to the valves. Where the cabinet heater is shown to be recessed or semi-recessed, provide neat, close-fitting metal trim strips to form a permanent bond between the unit heater and the wall.
- E. Provide all enclosures with one prime coat of paint.

## **2.3 AIR CURTAINS**

- A. Provide air curtains consisting of a top casing and a lower blower assembly section. Provide mounting holes on each end of the top casing for easy installation. The air curtain shall be primed and have a baked-on enamel finish.
- B. Bolt the air blower assembly section to the top casing with bolts on each end. Provide for easy removal for inspection and service. This section shall contain all the mechanical moving parts mounted on a rigid base that is reinforced by mechanical tubing extending the full length of the unit. This design is to permit the unit to be supported on the ends with no intermediate support. Assemble dynamically balanced forward curved double inlet blower wheels, with welded hubs, in matching blower housings with inlet venturies. These blowers shall be directly driven through flexible couplings, (to insure proper alignment and long life), by 1,200 rpm teao motors. Support each blower wheel by permanently lubricated 1" sealed ball bearings, encased in vibration isolating rubber cartridges. Aerodynamically formed fiberglass air diverters, located between the discharge of blowers and the discharge nozzle, shall evenly distribute the air along the full nozzle length with minimum turbulence, energy loss and noise, (73 dBA maximum).



- C. Equip the 4½" deep discharge nozzle with louvers for side deflection, and the entire discharge nozzle chamber shall be movable to insure deflection of the entire air stream +20 degrees without loss of discharge velocity or opening area. The air volume shall be adjustable from 100% to 50% by a damper supplied in the discharge chamber.
- D. The number and sizes of motors and performance data of each air curtain shall be determined by the width of each unit and shall be shown on the schedule sheet.
- E. Air curtains shall be licensed to bear the AMCA Certified Ratings Seal.
- F. Gas fired air curtains shall contain indirect fired gas heaters and shall be AGA approved. Mount the heaters to the intake of the air curtain by means of a companion flange transition supplied by the manufacturer. The air curtain and the heater shall be independently supported, as the transition shall be designed to conduct the air between the air curtain and indirect gas heater only. Provide orifices for natural gas, aluminized steel heat exchanger and burners, 120 volt supply voltage, factory installed power ventor, 120 volt limit control voltage transformer, combustion air pressure switch, and spark ignited intermittent safety pilot system with electronic flame supervision.
- G. Provide the following accessories:
  - 1. The air curtain shall have the inlet in front on top.
  - 2. Control panel is to be a UL listed industrial control panel. The control panel shall consist of an oil tight, NEMA 12 enclosure with neoprene door gasket J.I.C. standard E.G.P.-1-1967 and shall be mounted on the unit (or remote mounted). Included in the panel shall be UL listed components consisting of motor starter, motor overload, control transformer with 120 volt fused secondary, all pre-wired. Panel to accept power supply as indicated on equipment schedules.
  - 3. One (1) on-off-automatic switch shall be installed remotely in the door area to bypass the door switch and activate the unit when the door is closed, deactivate the unit, or let the unit operate automatically by utilizing the door switch.
  - 4. One (1) pair extension brackets shall be supplied to permit the mounting of the air curtain to clear the sides of the door, by 12" on each side.

## 2.4 CONTROLS

- A. Unit Heaters
  - 1. Thermostats shall be furnished under Section 23 09 23 "Building Management and Control System (BMCS)" unit manufacturer. Thermostats shall be line voltage, and designed to operate on a 3° differential over a temperature range of 45°-75°.
  - 2. Provide a strap on aquastat mounted on the hot water supply pipe that will prevent fan operation when heating medium is not available.



- B. Provide cabinet heaters with integral thermostats controlling the unit fan. Provide an On/Off switch with overload protection and a strap on aquastat mounted on the supply connection to each wet heater, wired to prevent the fan from operating when the heating medium is not available.

## **2.5 MANUFACTURERS**

- A. Cabinet Heaters and Unit Heaters
  - 1. Trane
  - 2. Modine
  - 3. Airtherm
  - 4. York
  - 5. Or approved equal

## **PART 3 - EXECUTION**

### **3.1 ACCESSORIES**

- A. Provide shut-off valves, balancing cocks and manual air vent for each radiator, convector or finned tube element.
- B. When indicated, provide mechanical flow balancing cartridges consisting of spring actuated Venturi plate designed to maintain a constant water flow independent of system pressure fluctuation.

**END OF SECTION 23 84 40**



**SECTION 23 85 00  
VARIABLE FREQUENCY CONTROLLERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Variable Frequency Controller.
- B. Control Interface.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Provide manufacturer's descriptive literature, installation instructions, operating instructions, and maintenance and repair data.
- C. Provide all electric wiring control diagrams for the VFC operation.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Test all integrated circuits (TTL) and all components used for circuit board construction to an acceptance criteria of 0.5% AQL (Accepted Quality Level).
- C. Conduct in-circuit testing of all printed circuit boards to insure proper mounting and correct value of all components.
- D. Burn-in all printed circuit boards for at least 24 hours, at a minimum of 70°C, and temperature cycled.



- E. Functionally test final printed circuit board assemblies via computerized test equipment where all tests and acceptance criteria are preprogrammed and test results are stored as detailed quality assurance data. The Commissioner may witness the factory tests. Provide at least two (2) weeks written notice prior to start of the factory test.
- F. Combine-test all fully assembled controls for performance and functionality at the manufacturer's factory with fully loaded induction motors. Analyze the combined test data to insure adherence to quality assurance specifications.
- G. Design and build the variable frequency controllers to the following standards:
  - 1. E.T.L. and/or U.L.
  - 2. NEMA - ICS-3-303.
  - 3. F.C.C. Class A.
  - 4. IEEE STD 444 (ANSI C34.3).

## **1.5 GUARANTEE**

- A. The Contractor shall guarantee the labor and material in this specification to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During this period, the Contractor shall furnish all labor to repair or replace all items or components, which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during guarantee period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to City of New York.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. The manufacturer must provide local, in-house service backup which must include properly trained personnel specifically trained for electrical component maintenance and troubleshooting.
- B. Purchase motors and variable frequency controllers from a single source. Verify in writing that the motors and variable frequency controllers operate together as a system; fully compatible and without excessive noise or vibration.

### **2.2 CONSTRUCTION**

- A. Provide 208 VAC variable frequency controllers of the pulse width modulated (PWM) design that operate directly from three phase, 208 VAC  $\pm 10\%$ , 60 hertz utility power. The VFC will generate a sine-coded, adjustable voltage/frequency three phase output for complete speed control of any NEMA B squirrel cage induction motor. The VFC to maintain a 120% current overload capability for 60 seconds with automatic stall prevention and voltage boost to prevent nuisance tripping during load or line side transient conditions. The VFC not to induce voltage line matching distortion back to the building electrical power supply system and to



maintain a power factor of not less than 0.95 throughout its speed range. Provide a tuned line filter, adjusted as required to prevent any electrical distortion back into the building electrical power supply system. Comply with FCC Class A noise emissions standard and so label.

- B. Provide the variable frequency controller with the following basic design:
1. Converter: Consists of a modularized diode rectifier and capacitor assembly which will first convert, then filter and maintain a fixed DC voltage source from the fixed voltage and frequency input.
  2. Inverter: Inverter uses power transistor semiconductors with a minimum rating of 1100 VAC on 208 VAC controls to invert the converter generator fixed DC voltage into a sine-coded pulse width modulated output.
  3. Control Logic: Consists of a single printed circuit board and incorporates an 8-bit, or larger, microcomputer central processing unit to control all inverter, converter, base drive and external interface functions.
  4. Terminal strip for input signals from Building Control System for remote start/stop and speed control signal capabilities. Refer to the controls documents for interface and coordination.
  5. Enclosure: NEMA 1 enclosure, for typical indoor locations. Utilize NEMA Type 32 for outdoor locations and NEMA Type 4 for wet locations subject to water spray or very high humidity.

### 2.3 FEATURES

- A. Include with the variable frequency controller the following minimum design features as standard:
1. Sine-coded, pulse width modulated output.
  2. Eight (8) bit, or larger, microcomputer control logic.
  3. Maximum and minimum speed adjustment capability.
  4. Controlled speed range of 20:1, or greater.
  5. Overload capability of 20% for 60 seconds.
  6. Process follower 4-20 mA or 1-10 VDC, input.
  7. Minimum of three (3) selectable output frequency ranges.
  8. Fifteen selectable volts/hertz patterns.
  9. Touch-pad operator controls or adjustable potentiometer with at least four (4) segment digital frequency/speedometer or digital readout displaying: output frequency, status, percent current, and percent response signal.
  10. Input disconnect/circuit breaker with thru-door handle.



11. Torque or current limiting circuit.
  12. Coast or ramp to stop.
  13. Electronic reversing.
  14. Adjustable acceleration and deceleration.
  15. Fault indicators.
  16. Fault contacts for interface with BMCS controls systems
  17. External start/stop signal capability from the building control system.
  18. External speed control from a 4-20 mA or 0-10 VDC signal from control system.
- B. Provide the variable frequency controller with the following protective features as a minimum:
1. Ground fault protection.
  2. Electronic thermal motor overload or current limit control.
  3. Current limited stall prevention during acceleration, deceleration, and run conditions.
  4. Automatic restart, after momentary power loss or momentary over-voltage. No restart into ground fault.
  5. Controls for start into a rotating motor.
  6. Anti-windmill protection.
  7. Fault indicators shall indicate the following fault conditions:
    - a. Over-current
    - b. Overload
    - c. Over-voltage
    - d. Over-temperature
    - e. Control function error.
  8. DC bus discharge indicator.
  9. Current limiting DC bus fuse.
  10. Isolated operator controls.



11. Phase-to-phase short circuit protection.
  12. Heat sink over-temperature protection.
- C. Make the following adjustments available on all variable frequency controllers:
1. Acceleration - 0.2 to 1800 seconds or 0.1 to 300 seconds.
  2. Deceleration - 0.2 to 1800 seconds or 0.1 to 300 seconds.
  3. Volts/hertz adjustments.
  4. Maximum frequency range.
  5. Minimum frequency.
  6. Maximum frequency.
  7. Carrier frequency.
  8. Torque limit.
  9. The inverter supplier to provide line filters on the line to prevent interference from the line to the drive and prevent any electrical harmonic distortion back to the building electrical power supply system.
  10. Provide a signal isolator to isolate the control signal to and from the inverter drive.
- D. Provide the variable frequency controller with the following additional features:
1. One (1) door interlocked main power input disconnect circuit breaker to provide positive shutdown of all input power to the drive.
  2. The complete circuit breaker and overload relay package shall be mounted in the inverter cabinet or may also be available in its own separate enclosure adjacent to the inverter.
  3. 2200 Microfarad ride-through capacitor which shall provide assistance to maintain the D.C. bus voltage for a two-second momentary power loss or furnish automatic restart capability which allows restart into a rotating motor.
  4. One (1) complete set of spare parts for each size inverter consisting of the following:
    - a. Control fuses.
    - b. Control board.
    - c. Drive board.
    - d. Transistors.



e. Capacitors.

E. Manual Bypass

1. Provide all the circuitry necessary to safely transfer the motor from the VFC to the power line, or from the line to controller at zero speed. Include a separate cabinet for the bypass circuit to house all devices which must be energized at either 208 VAC or 115 VAC.
2. On the bypass cabinet include a door interlocked main power input disconnect circuit breaker, providing positive shutdown of all input power to both the bypass circuitry and the VFC. Motor protection to be provided in both the "Controller" mode and the "Bypass" mode by a motor overload relay.
3. The bypass cabinet door to include a "Controller-Off-Bypass" selector switch and "Controller Mode" indicator light and a "Bypass Mode" indicator light. Provide terminals for remote light indication of mode selection.
4. Include a door interlocked input disconnect circuit breaker for the bypass circuit installed in the VFC to facilitate troubleshooting and testing of the controller safely, both energized and de-energized, while operating in the "Bypass" mode.
5. Factory install the manual bypass with magnetic contactors.
6. Controller to be constructed so as to allow power to be disconnected from either mode yet maintain power to the other mode for uninterrupted motor operation. This disconnecting means must completely isolate either mode for maintenance purposes.

**2.4 ENVIRONMENT**

- A. Design the variable frequency controller to operate within the following environmental and service conditions:
1. Ambient service temperature - 10°C to 40°C.
  2. Ambient storage temperature - 20°C to 60°C.
  3. Humidity - noncondensing to 90%.
  4. Altitude to 3300 feet.
  5. Service factor - 1.0.
  6. Input voltage - three phase, 208 VAC  $\pm$ 10%.
  7. Input frequency - 60 hertz  $\pm$ 5%.



**2.5 MANUFACTURERS**

- A. Asea-Brown-Boveri Parametrics
- B. Robicon
- C. Eaton
- D. Toshiba
- E. Or approved equal

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. All drive components including motor, sheaves, belts, fans pumps must have vibration levels checked at all speeds between 20 percent and 100 percent of the driven unit's design rpm. Vibration must be checked at fan pump shaft bearings in radial (vertical and horizontal) and axial directions. If excessive vibration is found at any frequency, special balancing and structural changes must be provided to minimize harmonic vibrations.

**END OF SECTION 23 85 00**



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**SECTION 23 85 20  
CARBON MONOXIDE CONTROL SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].
- B. Provide Carbon Monoxide Control Systems in accordance with the Contract Documents.

**1.2 WORK INCLUDED**

- A. Installation of Carbon Monoxide (CO) Detection Systems complete as indicated.
- B. Furnishing and installing all necessary sample tubing and terminal filters.
- C. Calibration Equipment.
- D. Start-up and Instruction Service.
- E. Guarantee.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit complete installation description including wiring diagrams, piping diagrams, and controls description.
- C. Contractor Guarantee - The CO detection system control console and accessory equipment (excluding all normally expendable items) shall be guaranteed by the Contractor against defective materials and workmanship for a period of one (1) year from substantial completion.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Complete system to be U.L. approved.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Measure carbon monoxide by means of catalytic oxidation principle. Provide dry type detection cell.
- B. Install system such that calibration is accomplished by one person direct at the CO detection system console.
- C. Life span of measurement cell shall be a minimum of ten (10) years. Electro-chemical type measurement cell will not be acceptable.
- D. Provide detection cell layout that is unaffected by position attitude, atmospheric pressure, and is nonsensible to nominal variations in sample flow rate.
- E. Provide nominal scale width on indicator of minimum 4½", with a readability of better than ½ ppm.
- F. Provide full scale range of CO detection system 0 to 100 parts per million CO in air. Ranges higher than 100 ppm are not acceptable.
- G. Detection cell is to be selective to CO, catalyst life to average 18-24 months before need for replacement.
- H. Accuracy shall be ±1% of full-scale reading. Repeatability shall be ±1% of full scale reading.

### **2.2 CONTROL MODULE**

- A. Provide free-standing CO control modules. Each module section to consist of a control unit assembly section, detector assembly section, and a sample handling and conditioning assembly section. Full hinged locking doors are to be provided. Front access sections are to be provided. The control module to contain detection cell assembly, sample flow controls, equipment to sequentially sample from each of the monitor points, and relay circuitry as required. Thirty (30) ampere rated field interconnect block construction is to be furnished.

### **2.3 SAMPLE FLOW SYSTEM**

- A. Install replaceable dust filters at inlet of each sample tube run.
- B. Draw sample at a rapid rate through tubing lines. Maintain flow through succeeding line during analysis of a given point. Sample flow through the analysis cell shall be under positive pressure.
- C. Supply a non-lubricated cell bypass pump with electric speed control. Provide "No Sample Flow" indication and alarm.
- D. Pre-scrubber assembly is to be provided.
- E. Replaceable cartridge-type scrubber shall have an average 12-month life prior to replacement need.

**2.4 CONTROL MODULE**

- A. CO analyzer control module shall operate electrically independent of any other, and the electrical shutdown of one particular control module shall not affect the operation of another.
- B. The CO analyzer system shall be designed to operate from 115 VAC, 60 Hz, single phase power supply.
- C. Each sample point on each control module shall have an identifiable white illuminated digit readout, said identification being synchronized with the automatic sample programmer.
- D. Amber malfunction indicator lamps shall be provided on each control module and is to illuminate on "Lack of Sample Flow", "Programmer Stop", or "Low Cell Temperature".
- E. All electrical terminations within CO control module are to be at 30 ampere-rated identified blocks to facilitate field interconnects.
- F. Range on each control module shall be 0-100 ppm CO in air, with threshold sensitivity less than 1 ppm CO in air.
- G. Accuracy to be  $\pm 1\%$  of full scale reading, and circuitry shall be such that zero adjustments are not required.
- H. Amber "CO Warning Concentration" lamps, associated with each sample point shall be provided on the control module.
- I. Provide red "CO Alarm Concentration" lamp on the control modules.
- J. Provide lamp test circuitry to permit an illumination check of all function lamps.
- K. Provide at least one unpowered set SPDT contacts to permit the following external operations: (Note: Additional sets may be required to properly control equipment involved).

CO Concentration	Fan and Alarm Operation
Below 50 ppm	Exhaust fans operate per normal controls. Provide in accordance with NYC ECC C403.2.6.2.
At 50 ppm Increasing	Exhaust fans will operate.
At 90 ppm Increasing	Visual/Audible alerts send alarm.
At 50 ppm Decreasing	Respective exhaust fans "OFF" after 15-minute override (OFF-DELAY).

**2.5 CALIBRATION EQUIPMENT**

- A. Provide a manually-operated calibration valve in each detector module to permit introduction of calibration gas to the CO analyzer detection cell to permit checking and adjusting span.



- B. Provide a cylinder containing a certified mixture for 100 ppm CO in air range, complete with a regulator gauge set and mounted integral to the console. Nitrogen-CO mixtures are not acceptable and shall not be employed.

## **2.6 MANUFACTURERS**

- A. Devco Series 1000.
- B. Beckman Industrial Model 868.
- C. OMNTEC Model OEL
- D. Or approved equal.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Following installation of the CO detection system by the Contractor, the manufacturer shall provide services of a factory engineer to check out the system, and instruct the City of New York's personnel on operation and maintenance of the system.
- B. Furnish and install all sample tube lines from sample pickup points to the identified bulkhead unions on the CO control modules, using 3/8" O.D., Type L, hard-drawn seamless copper tube with solder fittings. Compression bulkhead unions shall be provided on the CO detection system control modules.
- C. All tubing shall be run along ceiling in such a manner as not to be exposed to abuse. Attach all tubing securely to building structure using copper-plated clips and approved anchors.
- D. All tubing shall be cleaned thoroughly before installation and then blown out after installation to ensure that no foreign matter remains in the system. Open ends of tubing should be capped during construction to insure foreign matter does not enter tubing. Test to be as required during work progress to insure against leaks.

**END OF SECTION 23 85 20**



**SECTION 23 86 00  
ELECTRIC MOTOR CONTROLLERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Combination Starters and Disconnect Switches.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
1. Submit a list of motor controllers required for the project. This list should include equipment tag, equipment motor size, starter type, starter features.
  2. Submit a statement of understanding that each starter has a withstand rating that is coordinated with the electrical system installation.
  3. Submit shop drawings and manufacturer's data for all items in accordance with the conditions of the contract.
  4. Include control diagrams, unit wiring diagram for each motor controller, assembly outline drawings, summary sheets, shop interwiring diagrams, field connection diagrams, and nameplates with legends.
- C. Include a statement verifying coordination with the automatic temperature controls and the fire alarm system.



#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Motor Controllers: Comply with Underwriters' Laboratories standard UL-508 (being transitioned to WL 60947) and National Electrical Manufacturers Association Standard ICS 2-2000.
- C. Disconnect Switches: Comply with National Electrical Manufacturers Standard ICS 2-1996, Part 8 (R 2004, R 2009).
- D. Warranty shall be for 5 Years from substantial completion and shall cover replacement parts on all components.

### **PART 2 - PRODUCTS**

#### **2.1 COMBINATION STARTERS AND DISCONNECT SWITCHES**

- A. Provide suitable fully coordinated starting and controlling equipment for motors as required. Arrange the starting equipment as indicated in other sections of these specifications.
- B. Consult with each trade affected to determine the exact requirements for each device.
- C. Coordinate with all Contractors to establish required auxiliaries, including relays, contacts, terminals and the like. All three phase starters to have a minimum of (2) normally open and (2) normally closed auxiliary contacts.
- D. All starter interface and termination points for all Contractors shall be made at a terminal strip provided with the motor controller.
- E. Provide individual starters fully enclosed in neatly finished ventilated boxes of code gauge steel, machine formed and welded. Provide boxes arranged for floor, wall or angle iron frame mounting including a door with a spring catch handle with facility to lock handle in open position.
- F. Provide engraved nameplates for each unit, nomenclature of each to be approved prior to fabrication.
- G. Provide starters for motors less than 1/2 horsepower, as 120 volt, 1-phase, 60 cycle alternating current service with pilot light. Provide manual starters with overload protection and lockout type disconnect switch to control such motors, except where interlocks or automatic controls are required. In such cases, provide magnetic across-the-line starters.
- H. Fire smoke dampers, smoke dampers and automatic louver dampers will be started using addressable relay modules provided by the fire alarm or building control compactor.
- I. Provide starters for motors 1/2 horsepower to 100 horsepower as magnetic across-the-line, combination Motor Circuit Protector or Circuit Breaker type. Such starters to be 208 volt, 3-phase, 60 cycle, alternating current service.



- J. Provide starters for motors over 100 horsepower to be magnetic, combination Soft Start with Motor Circuit Protector Switch. Such starters to be 208 volt, 3-phase, 60 cycle, alternating current service.
- K. Provide magnetic starters subject to manual start and in direct view of the motors they control with momentary contact start and stop buttons built into cover. Provide magnetic starters subject to electrical interlock or automatic control with Hand-Off-Automatic switches built into cover. Provide selector switches in starters to be of the maintained-contact type, water tight and dust tight.
- L. Provide starters with water tight and dust tight, (5) pilot lights on the following indications: Hand, Off, Auto, Run, and Overload.
- M. Provide starters for service at voltages higher than 120 volt with transformers for 120 volt secondary service built into each starter casing to serve control circuits.
- N. Provide each starter subject to electrical interlock and/or automatic control with the necessary auxiliary contacts plus one spare set of normally open and normally closed auxiliary contacts. Provide one set of terminals for each control circuit.
- O. Provide magnetic starters with Solid State Electronic Overload Relay which shall protect all three phases with a wide range current setting and trip class to allow field adjustment for specific motor FLA. Interchangeable heater elements are not acceptable. Overload relay shall provide phase failure, phase loss, locked rotor and stall protection.
- P. Provide coils, cores, resistance, insulation, contacts, trippers, etc., for starters and relays. The motor circuit protector shall be UL listed 508 current limiting manual motor starters with magnetic trip elements only. The breaker shall carry a UL 508F rating which provides for coordinated short circuit rating for use with the NEMA rated motor contactor and provides a minimum interrupting rating of 30 KAIC for the combination starter.
- Q. Provide over/under voltage and phase monitoring capability. Monitor shall be field adjustable for both over and under voltage levels and a delay time before returning to normal operation after a trip.
- R. Mount individual motor controllers in NEMA Type 1A enclosures for typical indoor locations. Utilize NEMA Type 3R for outdoor locations and NEMA Type 4 for other wet locations or locations subject to water spray or very high humidity.
- S. Coordinate the withstand rating of all starter components with the Contractor and with the requirements of the electrical system. Starters that do not have appropriate withstand rating shall be removed from the project – at no cost – for operator safety.

## **2.2 MOTOR CONTROL CENTERS**

- A. Provided by Division 26.



### **2.3 MANUFACTURERS**

- A. Cerus
- B. General Electric
- C. Square Dee
- D. Siemens
- E. Eaton/Cutler Hammer
- F. Allen Bradley
- G. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Motor controllers will be installed under work of Division 26.
- B. Various pieces of packaged equipment will be provided with starters installed by manufacturer at the factory. Coordinate the Division 26 work with these starters.
- C. Review Division 26 and/or Building Management Control System (BMCS) Documents for required accessories, interlocks, etc. Failure to fully coordinate this item with the other Divisions in no way relieves this Contractor from providing a complete, functional, and coordinated system as described.

**END OF SECTION 23 86 00**



**SECTION 26 02 65  
ELECTRICAL TESTING, ADJUSTING AND BALANCING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Testing, adjusting, and balancing for:
1. Wire and Cable (600 Volts and Below).
  2. Motor Controllers, including variable frequency drives.
  3. Motors.
  4. Ballasts.
  5. Air Handling Plenums and Luminaires.
  6. Grounding.

**1.3 SUBMITTAL PROCEDURES**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents comply with the latest applicable provisions and the latest recommendations of the following:
1. Industry standards shall apply except as otherwise specified.



2. Testing Agency Qualifications: as specified in each section within this specification containing electrical testing requirements.
3. NETA.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. Provide all labor and materials required by shop and field acceptance testing, adjusting, and balancing as specified in the Contract Documents.

### **2.2 SYSTEMS**

- A. The following systems shall be tested, inspected and certified.
  1. Wire and Cable (600 Volts and Below):
    - a. Inspect all splices and terminations and make mechanically and electrically tight during a fifteen (15) day period immediately prior to substantial completion of the work.
    - b. Perform standard 600 volt insulation resistance test with "megger" tester and all conductors. Test shall show insulation resistance in excess of minimum values required by the NETA and continuity. Submit certification to the Commissioner.
  2. Motor Controllers:
    - a. Submit with certification in tabular form a complete listing of all motors on the project for which motor controllers, including variable frequency drives, have been furnished. Include on this listing, the nameplate full load amperes of each motor and the size overload heaters installed in each motor controller.
  3. Motors:
    - a. Test all motors under load and verify that motor rotation is correct.
  4. Life Safety Fire Alarm Systems:
    - a. All fire alarm system wiring must be inspected and tested to ensure that there are no grounds, opens or shorts. The minimum allowable resistance between any two conductors or between conductors and ground is ten (10) megohms as measured with a 500 volt megger after all conduit, conductors, detector bases, etc., have been installed, but before the detector devices are plugged into the bases or end-of-line devices installed.



- b. The Contractor must perform all electrical and mechanical tests required by the equipment manufacturers. A checkout report shall be prepared by the technician and submitted in triplicate, one copy of which will be registered with the equipment manufacturer. The report shall include, but shall not be limited to:
    - 1) A complete list of equipment installed and wired.
    - 2) Indication that all equipment is properly installed and functions in conformance with these specifications.
    - 3) Tests results of all individual zones.
    - 4) Serial numbers, locations by zone and model number for each installed detector.
    - 5) Voltage (sensitivity) settings for each ionization detector as measured in place.
    - 6) Response time on all detectors.
    - 7) Contractor shall submit a certified report indicating the following:
      - a) Operating all manual stations and all detectors that can be reset.
      - b) Verifying line supervision of each initiating and indicating circuit.
      - c) Verifying the operation of each initiating circuit.
      - d) Verifying the operation of all indicating devices.
      - e) Verifying the operation of all alarm-initiated functions.
      - f) Verifying full operation of the FACP.
5. Grounding:
- a. Upon completion of the electrical grounding system, the contractor shall test the grounding system for stray currents, grounds, shorts, etc. These tests shall be performed with approved calibrated instruments.
  - b. Perform point-to-point tests to determine the resistance between the main grounding system and all electrical equipment frames, system neutral, and all derived neutral points.
  - c. The Contractor shall submit in writing to the Commissioner a letter indicating the ohmic resistance of the service grounds and a statement that the grounding system is free of all defects, stray currents, shorts, etc.



## **2.3 CALIBRATION**

- A. Calibrate and adjust all components in accordance with manufacturer's procedures and recommendations or as required, for the following categories of equipment:
  - 1. 600V switchboards and switchgears.
  - 2. Lighting fixtures (lamp positions, reflector positions, etc., as required).
  - 3. Motor Control Centers and motor starters.
- B. Provide overloads in all motor starters, in accordance with motor nameplate data and as recommended by the manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 GENERAL**

- A. Notify the Commissioner seven (7) days prior to the testing dates. If the Commissioner so elects not to witness a specific test a statement of certification must be forwarded to the Commissioner for his approval.
- B. Conduct tests at a time agreeable to the Commissioner.
- C. Products which are found defective or do not pass such tests shall be removed and replaced. All tests shall be repeated until equipment meets all testing criteria.
- D. Arrange for and conduct all test and inspections required by the NYC BC. All fees for testing and inspection shall be paid by the Contractor.
- E. All test results shall be submitted to the Commissioner.
- F. Refer to individual specification sections for additional equipment testing requirements.

**END OF SECTION 26 02 65**



**SECTION 26 02 80  
EQUIPMENT CONNECTIONS AND COORDINATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide final connections to equipment and coordinate same in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Equipment to receive final connections shall include but is not limited to the following:
  - 1. Motors and Equipment.
  - 2. Dampers, ALDs and VAVs.
  - 3. Equipment furnished by others.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. None required.



## 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  - 1. American National Standard Safety Code for Elevators Dumbwaiters and Moving Walks (ANSI A17.1).
  - 2. New York City Building Code, 2011 edition.

## PART 2 - PRODUCTS

- 2.1 Not used.

## PART 3 - EXECUTION

### 3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

### 3.2 MOTORS AND EQUIPMENT

- A. Connections for and coordination of motors and equipment requiring electrical connections shall be included but is not be limited to the following:
  - 1. Install motor controllers and disconnect switches for each motor and each piece of equipment. The contractor must refer to all other trades' design drawings for location and power requirements of all motors and other equipment. If any discrepancies are found the contractor shall include in his base price the more expensive option.
  - 2. Verify that the motor rotation is correct and reconnect if necessary.
  - 3. Provide separate ground conductor in flexible metal conduit so as to provide an electrically continuous ground path. Ground all equipment.
  - 4. Provide motor branch circuit conductors and connections to each individual motor controller and from each controller to the motor through an approved disconnect switch. Make final connection in a minimum of 24-inch length of liquid-tight, flexible, metal conduit.
  - 5. Provide all necessary wiring and connections for interlocking, remote and automatic controls. Installation of equipment and wiring shall be in compliance with the manufacturer's recommendations.



6. Where equipment is fed from a branch circuit routed in or under the slab, terminate branch circuit at a junction box on 2-foot rigid conduit stub-up and make final connection to equipment in liquid-tight, flexible, metal conduit. Provide suitable knee brace on conduit stub-up.
7. Where equipment is fed from overhead, support conduit feeder descending from ceiling on flanged floor fitting with conduit type fitting connecting to a motor with 24-inch minimum of liquid-tight flexible metal conduit.
8. Where nameplate on equipment indicates fuse protection, the disconnecting means shall be equipped with time delay fuses.
9. Where condensate pumps or other equipment is installed above hung ceilings such equipment shall not be connected via cord & plug and must be hardwired using permanent wiring methods.

### 3.3 **EQUIPMENT FURNISHED BY OTHERS**

- A. The requirements for equipment furnished by Others for installation by this Contractor shall include but is not limited to the following:
  1. The coordination of the proper delivery scheduling of such equipment.
  2. The receiving and unloading of such equipment at the property line.
  3. The inspection of such equipment for damage, defacement, corrosion, missing components, etc., at the job site. All deficiencies shall be recorded. Deficiencies occurring after inspection shall be corrected by this Contractor.
  4. The safe handling at secure storage of such equipment from unloading to the time of permanent installation.
  5. The completion of field make-up of internal wiring as required.
  6. The lamping of equipment, with new lamps.
  7. The installation of accessories on such equipment.
  8. The installation of such equipment including the transportation of the equipment to the installation area, and the installation of all supports, fasteners, canopies, extensions, etc. required to insure safe support and adaptation to the finished structural, electrical and architectural conditions.
  9. The final connections and grounding to the building electrical system including all necessary labor and materials including but not limited to junction box extensions, lug change outs, wiring, conduit, etc.
  10. The testing of such equipment in its final location.

**END OF SECTION 26 02 80**



**Department of  
Design and  
Construction**

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**SECTION 26 05 19  
600 VOLT WIRE AND CABLE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide 600 volt wire and cable in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Wire and Cable.
- B. Connectors and Terminations.
- C. Electrical Tape.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: for each type of conductor, connectors and termination assemblies.
- C. Field Test Reports.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:



1. Underwriters' Laboratories labeling of all insulations and jackets.
2. 2011 NYC Electrical Code
3. NRTL
4. Connections
  - a. 486A & 486B.

## **PART 2 - PRODUCTS**

### **2.1 WIRE AND CABLE**

#### **A. General**

1. Provide wire and cable with a minimum insulating rating of 600 volts, except for wire used in 50 volts or below applications. For control or signal systems, use 300 volt minimum or 600 volt where permitted to be incorporated with other wiring systems.

#### **B. Conductors**

1. Provide factory fabricated electrical grade, annealed copper conductors and fabricated in accordance with ASTM B3 standards.

#### **C. Stranding and Number of Conductors**

1. No. 12 and 10 AWG conductors shall be solid.
2. Conductors larger than No. 10 AWG shall be stranded in accordance with ASTM Class B stranding designations.
3. Control wires shall be stranded in accordance with ASTM Class B stranding designations.

#### **D. Insulated Single Conductors**

1. Type THW or THWN - Thermoplastic insulation suitable for use in wet locations up to 75°C.

#### **E. Multi-Conductor Control and Supervisory Control Cables**

1. Size No. 16 AWG, minimum.
2. Suitable for direct burial, open air, duct or conduit installation.
3. Temperature Rating: 75°C Wet or Dry.
4. Uninsulated ground wire.



5. Cross-linked polyethylene conductor insulation; thickness satisfying requirements of ICEA.
6. Flame-retardant overall polyvinyl jacket satisfying the requirements of ICEA.
7. Individual conductors bound together with overall binder tape prior to jacket application.
8. Individual conductors rating of 300 volts (instead of 600 volts) for cables designated Supervisory Control Cable.
9. Factory color coded.

**F. Manufacturers**

1. Products by any manufacturer meeting the performance requirements specified herein may be utilized, but are not limited to, the following manufacturers:
  - a. American Insulated Wire Corp.
  - b. General Cable Corporation
  - c. Southwire Company
  - d. Belden
  - e. Pyrotex/Tyco
  - f. Or approved equal

**2.2 CONNECTORS**

**A. Wire No. 10 AWG and Smaller**

1. Hand-Applied:
  - a. Coiled tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by hand.
2. Tool-Applied:
  - a. Steel cap, with conduction and corrosion resistant metallic plating, open at both ends, fitted around the twisted ends of the wire and compressed or crimped by means of a special die designed for the purpose. Specifically fitted plastic or rubber insulating cover wrap over each connector.
  - b. Hydraulic tool of same manufacturer as lug which shall emboss on the connector the proper die number for inspection.



B. Manufacturers

1. Hubbell
2. OZ/Gedney
3. Thomas & Betts
4. Or approved equal

**2.3 INSULATING TAPE**

A. Provide vinyl plastic tape that meets the requirements of UL 510 and has the following characteristics:

1. 8.5 mil minimum thickness.
2. ASTM D-3005 Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape – Type 1.
3. Rated 600 volts and 105°C, suitable for indoor and outdoor applications.
4. Retains flexibility, adhesion, and applicable at temperature ranges from 0 through 100°F without loss of physical or electrical properties.
5. Resistant to abrasion, moisture, alkalis, acid, corrosion, and sunlight.
6. Manufacturer:
  - a. 3M
  - b. Shur Tape
  - c. U-Line
  - d. Or approved equal

**2.4 WIRE PULLING LUBRICANT**

- A. Provide wire pulling lubricant that is compatible with the conductor insulation, has a maximum coefficient of friction of 0.055, and is stable up to a temperature of 180°F. For cold weather installations, provide wire pulling lubricant suitable for conduit temperature.
- B. Compatibility with conductor insulation shall be determined in accordance with IEEE Std 1210 Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable.



**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**3.2 WIRE AND CABLE**

- A. Provide a complete system of conductors in a raceway system. Mount wiring through a specified raceway, regardless of voltage application.
- B. Contract Drawings do not indicate size of branch circuit wiring; use No. 12 AWG as a minimum. For 20 ampere branch circuits whose length from the panel to the furthest outlet exceeds 100 feet for 120-volt circuits, use No. 10 AWG or larger for the entire branch circuit installation.
- C. Provide dedicated neutral conductor and equipment ground conductor for each branch circuit serving television broadcast equipment, audio visual equipment and sound system equipment. If isolated grounds are shown as required, they shall also be dedicated.
- D. Provide dedicated neutral conductor for each dimmer branch circuit and for each ground fault interrupter branch circuits.
- E. Provide a shared neutral conductor, one (1) standard wire size greater than the branch circuit phase conductor, for all branch circuits to receptacle loads.
- F. Conductor Types
  - 1. Type THW or THWN - Use for lighting, receptacle and motor circuits and for panel and equipment feeders.
- G. Do not install wire in incomplete conduit runs nor until after concrete work and plastering is completed and moisture is swabbed from the conduits. Eliminate splices wherever possible. Where necessary, splice in readily accessible pull, junction, or outlet box.
- H. Provide cable supports for all vertical risers where required by the NEC not to exceed the following for copper conductors. Modify if aluminum conductors are used to meet the NEC requirements:

Copper Minimum Conductor Size	Vertical Supports
No. 18 AWG to No. 8 AWG	100 ft.
No. 6 AWG to No. 0 AWG	100 ft.
No. 00 AWG to No. 0000 AWG	80 ft.
211,601 CM to 350,000 CM	60 ft.



Copper Minimum Conductor Size	Vertical Supports
350,001 CM to 500,000 CM	50 ft.
500,001 CM to 750,000 CM	40 ft.

- I. Flashover or insulation value of joints to be equal to that of the conductor. Use Underwriters' Laboratories' listed connectors rated at 600 volts for general use and 1,000 volts for use between ballasts and lamps of gaseous discharge lighting fixtures.
- J. Use terminating fittings, connectors, etc., of a type suitable for the specified cable furnished. Make bends in cable at termination prior to installing compression device. Make fittings tight.
- K. Color Coding
  - 1. Provide consistent color coding of all AC feeders, sub-feeders, motor circuits and the likes as follows:

	208Y/120 Volts Code	480Y/277 Volts Code
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green
Isolated Ground	Green/Yellow Striped	N/A

- 2. Factory color code wire No. 2 AWG and smaller. Where color coding cannot be readily provided because of limited quantities involved, provide either of the following:
  - a. Plastic adhesive tape applied spirally and half-lapped over exposed portions of conductors within manholes, boxes, and similar enclosures. Tape shall be 3/4" minimum.
  - b. Colored tubing cut and inserted over ends of wire prior to installing terminals.
  - c. Provide black conductor insulation where colored tape is used to for color coding.
- 3. Wire No. 1 AWG and larger may be color coded by color taping of the entire length of the exposed ends.
- 4. Color code wiring for control systems installed in conjunction with mechanical and/or miscellaneous equipment in accordance with the wiring diagrams furnished with the equipment.



5. DC power system conductors shall be color coded; Positive – Red; Negative – Black.

### 3.3 INSTALLATION

#### A. General

1. Provide tools, equipment and materials to pull all wire and cable into place and to make required splices and termination.

#### B. Wire and Cable in Conduit, Duct or Wireway

1. Utilize roller bearing swivel to prevent twisting of cables entering the conduit or duct.
2. Take precautions to avoid entrance of dirt and water into the conduit and ducts.
3. Clean conduits and ducts to remove any pulling compound prior to pulling of cables.
4. Do not damage conductor insulation, braid jacket or sheath during installation. Any damaged conductors shall be replaced immediately.
5. Do not bend conductors to less than the manufacturer's recommended radius.
6. Lubricate cable if required for pulling.
7. Make splices only in pull boxes, junction boxes and outlet boxes.
8. Utilize cable reels on jacks for pulling through pull boxes, ducts and conduits so bends will not be excessive and conductors will not touch sharp edges; use feeding tube where required.
9. For large diameter cables, utilize properly sized pulling grips (endless woven basket two to four feet long of ductile steel).
10. Do not exceed maximum recommended pulling tension of wire and cable.
11. Fire seal around cables penetrating fire rated barriers.
12. Provide proper supports of the cables installed in cable support boxes, in accordance with the NEC.

#### C. Splices, Terminations and Connections

1. General: Except where lugs are furnished with the equipment, provide terminals and connectors suitable for the quantity, conductor size and direction of entry (top or bottom).
2. Insulated Flanged Terminals: Provide for connection of conductors No. 12 AWG and smaller to device terminals; do not exceed three (3) terminals at any single connections.
3. Circumferential Compression Type Connectors or Cytolok spring compression terminator (Provide for Splices and Connections No. 6 AWG and larger):



- a. Use for incoming and outgoing cable connections at enclosures and for ground connections.
- b. Use manufacturer's approved tool and correct size hex head which embosses die number on the connector or lug.
- c. Make crimped indentations parallel with insulation putty.
- d. Fill voids and irregularities with insulation putty.
- e. Cover neatly with four (4) layers of vinyl plastic tape except where insulated covers are permitted; half-lap tape in two (2) directions.
- f. Use spring-held bakelite covers over splices or taps only with the approval by the Commissioner.

**D. Wire Marker Identification Labels**

1. Utilize labels for those circuits where individual conductor identity is indicated on the Contract Drawings.
2. Apply to wires and cables at terminals and in all pull, junction and splice boxes.
3. Do not cut and splice multi-conductor control cable for purpose of labeling.
4. Clean surfaces before applying labels.

**3.4 FIELD TESTING**

- A. Test system wiring for continuity, grounds and short circuits prior to connection of any equipment.
- B. Test final equipment connections for continuity of grounds and short circuits.
- C. Insulation Resistance of Feeders and Subfeeders
  1. Test with megger for insulation resistance. Insulation resistance to comply with ICEA values.
  2. Correct faults and sections with faulty insulation.
- D. Remove and replace defective conductors and retest.

**END OF SECTION 26 05 19**



**SECTION 26 05 26  
GROUNDING SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 WORK INCLUDED**

- A. Ground Connectors and Clamps; Grounding, Bushings and Locknuts.
- B. Welding Type Ground Connectors.
- C. Compression Type Grid Connectors.
- D. Ground Rods, Plates, and Clamps.
- E. Bonding Jumpers for Hinged Joints in Cable Trays.
- F. Electrical Insulating Tape.
- G. Compound for Compression Connectors.
- H. Grounding Test Well
- I. Test Reports
1. Submit test reports certifying resistance values for buried or driven grounds and water pipe grounds.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.



#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  - 1. Underwriters Laboratory Standards No. 96, 467, and 486A.
  - 2. ANSI/IEEE C2 – National Electrical Safety Code, 2007 edition.
  - 3. IEEE Standard No. 142-1982, 1100-1992, and 80-2000 and IEEE 837-2002
  - 4. NFPA 780, 2009 edition
  - 5. NETA.
  - 6. 2011 NYC Electrical Code.
  - 7. ASTM B3, B8, and B33.
  - 8. NEMA GR1.
- C. Testing Agency Qualifications: An independent agency that is a member company of a nationally recognized testing laboratory (NRTL) as defined by OSHA.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. Ground Conductors: Bare or green color coded, insulated, annealed stranded tinned copper conductor as indicated on the Contract Drawings; insulated conductor to conform to the requirements of the conductor specification section herein.
- B. Mechanical Connectors: Tin-plated aluminum alloy, U.L. approved and stamped for use with aluminum or copper conductors. Connectors shall be heavy duty type and be highly conductive.
- C. Ground Rods
- D. Copper-clad steel core and electrolytic-grade copper outer sheath fabricated by molten welding process.
- E. Diameter: 3/4 inch.
- F. Length: 10 feet.
- G. Plate Electrode: Highly conductive copper plates, minimum 1/4" thick, 24-inch square.



- H. Ground Lugs and Connectors for Cable Tray: Tin-plated aluminum alloy, suitable for use with aluminum or copper conductors.
- I. Bonding Jumper Braid: Copper braided tape, constructed of 30-gauge bare copper wires and properly sized for indicated applications.
- J. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

## **2.2 IDENTIFICATION AND LABELING**

- A. Grounding conductors shall be marked with tie wrap style cable markers.

## **2.3 MANUFACTURERS**

- A. Erico Products, Inc
- B. Appleton Electric Company
- C. Kearney
- D. O-Z/Gedney Electric Company
- E. Raco, Inc.
- F. Thomas & Betts, Electrical
- G. Approved equal.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements

### **3.2 GENERAL**

- A. Purpose of the Grounding System.
  - 1. Adequate path for ground fault currents.
  - 2. Safety to personnel from accidental electric shock hazards.
  - 3. Prevention of hazardous discharge of static electricity.
- B. Whether or not indicated on the Contract Drawings, provide continuous ground path for all electrical circuits from point of utilization back to source through ground wires, bonded metallic conduit runs, grounded cable trays, and related items.



- C. Electrical Equipment: Provide complete exterior and interior grounding system, including grounding provisions for high and low voltage switchgear and transformers, motor control centers, lightning arrestors, motors and other equipment as indicated on the Contract Drawings.
- D. Miscellaneous Equipment: Provide complete grounding for metal lighting standards, supports for elevated metal floors, steel framework of the building, elevators, and other equipment as indicated on the Contract Drawings.
- E. Furnish and install electrical grounding systems as indicated on the Construction Documents and as specified herein.
- F. Grounding systems shall be installed in accordance with the requirements of NEC Article 250 and subject to the review of the Commissioner.
- G. All ground conductors and bonding jumpers shall be stranded copper installed in conduit. All ground conductors shall be without joints and splices over its entire length.
- H. The system neutral shall be grounded at the service entrance only, and kept isolated from the grounding systems throughout the building.
- I. Each system of continuous metallic piping and ductwork shall be grounded in accordance with the requirements of the NEC Article 250.
- J. Mechanical equipment shall be bonded to the building equipment grounding system. This shall include but is not limited to fans, pumps, chillers, etc.
- K. Non-metallic conduits and portions of metallic piping and duct systems which are isolated by flexible connections, insulated couplings, etc., shall be bonded to the equipment ground with a flexible bonding jumper or separate grounding conductor.
- L. Metal raceways, cable trays, cable armor, cable sheath, enclosures, frames, fittings and other metal noncurrent-carrying parts that are to serve as grounding conductors shall be effectively bonded where necessary to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed on them. Any nonconductive paint, enamel, or similar coating shall be removed at threads, contact points, and contact surfaces or be connected by means of fittings so designed as to make such removal unnecessary.

### **3.3 SERVICE GROUNDING SYSTEM**

- A. Provide a bare copper bus mounted within the electrical switchboard room. Bus shall be 4" H x 1/4" W x 2' L, equipped with type 304 stainless steel mounting brackets and fasteners. Provide the required insulators.
- B. Extend two (2) service grounding connectors in separate raceways from the ground bus to the ground bus in each switchboard.
- C. Extend conductors in raceway from service ground bus as indicated on the Contract Drawings.



**3.4 SWITCHBOARD, UNIT SUBSTATIONS AND PRIMARY SWITCHGEAR**

- A. Bond each section of the switchboard, unit substations, and primary switchgear housing and service conduits entering same to the ground bus.

**3.5 SEPARATELY DERIVED SYSTEMS**

- A. Equipment grounding conductors shall be provided for separately derived systems and shall be grounded to building steel, cold water pipes, etc., or an alternate grounding means. Equipment grounding shall consist of but is not to be limited to the following:
  - 1. Lighting transformers.
  - 2. Power transformers.

**3.6 RECEPTACLES**

- A. Receptacles shall be grounded to the outlet box by means of a bonding jumper between the outlet box and the receptacle grounding terminal.

**3.7 OUTDOOR EQUIPMENT**

- A. Outdoor enclosures shall be connected with No. 2 bare copper (minimum) cable installed not less than 24 inches below grade, connecting to the required ground rods. Fence and equipment connections shall be bare copper No. 2. Fence shall be grounded at each gate post and corner post. Each gate section shall be bonded to the fence post through a 1/8-inch by one-inch flexible braided copper strap and approved clamps.

**3.8 CONCENTRIC KNOCKOUTS**

- A. Provide grounding type bushings for conduits terminated through multiple concentric knockouts not fully knocked out on inside of the panelboards. Ground bushing with No. 12 AWG copper to panelboard ground bus.

**3.9 ELEVATED TRANSFORMER VAULTS**

- A. Provide a No. 4/0 AWG bare copper ground ring around the vault on the inside wall and directly accessible to each transformer that is installed. The ground ring shall be tied-off at two (opposite) ends with No. 4/0 AWG bare copper conductor and connected to the building service ground bus.

**3.10 TOGGLE SWITCHES**

- A. Provide grounding clip on each toggle switch. Mount over device mounting strap such that contact is made between mounting strap, faceplate and outlet box.
- B. Provide devices with ground screw where required and bond this with No. 10 AWG conductor to the associated outlet box.



### 3.11 GROUNDING METHODS

- A. Ground rods shall be copper-clad steel not less than 3/4 inch in diameter, ten (10) feet long, driven full length into the earth. The maximum resistance shall not exceed 5 ohms. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than six (6) feet on center. If sectional type rods are used, two additional sections may be coupled and driven with the first rod.
- B. The metal frame of the building, where effectively grounded.
- C. A metal underground water piping system used for grounding shall be in direct contact with the earth for ten feet or more and shall be electrically continuous. Provide bonding jumpers at the water meter and at the insulating joints.
- D. Steel reinforcing bars used for grounding shall be encased by at least two inches of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth. Reinforcing bars shall be minimum 1/2 inch diameter and consisting of twenty feet of one or more steel reinforcing bars.
- E. All bonding jumpers for the above grounding systems shall be sized in accordance with the NEC Article 250.

### 3.12 INSTALLATION

- A. Grounding Grid
  - 1. Install grounding grids with ground rods and cables as indicated on the Contract Drawings.
  - 2. Avoid splices in ground cables.
  - 3. Connectors:
    - a. Install mechanical connectors in above ground accessible locations only.
    - b. Install welding type ground connections or connection type grid grounding connectors underground, in manholes, or at inaccessible locations only.
    - c. Thoroughly clean contact surfaces before making connections.
    - d. Apply manufacturer's compound for compression connectors to conductors prior to crimping.
    - e. Made connections using compression type grid grounding connectors with approved manufacturer's hydraulic tool and correct size hex head die which, for inspection, embosses proper die number on connector.
  - 4. Make connection from ground grid to equipment ground buses as required by the NEC and as shown on the Contract Drawings.
  - 5. Provide for future disconnection for testing at all locations where building ground loop or grid connects to exterior or interior steel.



6. Wrap conductors with self-fusing electrical tape and cover with vinyl electrical tape where insulation of grounding system connections is required.
- B. Cold Water Pipe Grounding
1. Make connection with clamp type fitting; do not damage the incoming water pipe.
  2. Bond ground conductor and its conduit to the street side of the water pipe.
  3. Install No. 4/0 AWG bonding jumper with ground clamps around the water meter.
- C. Ground Conductors
1. Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
  2. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches below grade.
  3. Size as shown on the Contract Drawings or as required by NEC Table 250-95.
  4. Where ground conductors are required, install insulated copper ground conductors in steel conduit or as indicated.
  5. Where ground conductors are protected by metallic conduit, bond the conductor to the conduit at both ends.
  6. Connect ground conductors to appropriate ground buses (as in switchboards and distribution panelboards, etc.).
- D. Grounding Rods: Locate a minimum of 1-rod length from each other and at least the same distance from any other grounding electrode.
1. Drive until tops are 12 inches below finished floor or final grade, except as otherwise indicated.
  2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.
  3. Install in a ground well for future access and testing.
- E. Grounding Plates: Locate a minimum of six feet from each other and at least the same distance from any other grounding electrode.
1. Install a minimum 30 inches below finished floor or final grade.
  2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.



**F. Conduit Attachment to Electrical Equipment**

1. Ground conduits to metal framework of the electrical equipment with double locknuts or grounding bushings and bonding jumpers unless otherwise noted.
2. Install bonding jumpers at all electrical equipment to provide continuous ground return path through the metallic conduit system.
3. Install NEC approved bonding jumpers across expansion fittings between conduit sections for ground path continuity.
4. Where motors or other utilization equipment are connected to the electrical system with flexible conduit, the conduit shall be equipped with a ground conductor.

**G. Cable Trays and Wiring Troughs**

1. Use metallic raceway system for principal ground return path.
2. Bond together wiring troughs containing power circuits and tie to ground bus at the switchboards, panelboards; install minimum No. 4/0 AWG copper conductors for bonding between cable systems and switchboards ground buses.
3. Install a minimum No. 2 AWG insulated copper conductors for bonding between cable support system and conduit dropouts, service equipment or cabinets.
4. Apply antioxidant compound to contact surfaces for all bonding connections to cable trays.
5. Install bonding jumpers across hinged joints.

**H. Receptacles and Switches**

1. Install bonding jumpers between the outlet box and receptacle grounding terminal except where contact device or yoke is provided for grounding purposes.

**I. Wireways**

1. Install grounding jumpers for bonding between wireways and other panelboards, conduits, switchboards, and at any other point where a solid connection would otherwise not be provided in supporting the system to insure a continuous ground path.

**J. Panelboards**

1. Install bonding jumpers inside all panelboards to bond the feeder conduit to panelboards, except ground panelboards containing branch circuits each having less than 150 amperes current carrying capacity, with two standard locknuts and bushings, one inside and one outside, run up wrench tight.



**K. Dry-Type Transformers**

1. Perform grounding in accordance with NEC Article 250.
2. Install bonding jumper across flexible conduit from the transformer housing to the rigid conduit.

**L. Sheet Metal Boxes**

1. Install bonding jumpers inside all sheet metal boxes containing one or more feeders with current carrying capacity of 150 amperes or greater, to bond one conduit with another.
2. Ground boxes containing branch circuits only or feeders each less than 150 amperes current carrying capacity, with two standard locknuts and bushings, one inside and one outside, run up wrench tight. two standard locknuts and bushings, one inside and one outside, run up wrench tight.
3. Install bonding in sheet metal boxes in systems over 600 volts, regardless of current carrying capacity.

**M. Floor Boxes**

1. Install grounding jumpers where adequate ground connections are not provided through locking screws between high potential power service fittings, cover plates, and conduit system.

**3.13 FIELD QUALITY CONTROL**

- A. Measure resistance values for system and equipment grounds, for each ground rod and ground grid.
- B. Acceptable Testing Equipment: Vibroground by Associated Research, Inc.; or Megger Earth Tester by James G. Biddle Co. or approved equal.
- C. Method: Three (3) electrode fall of potential as prescribed by instrument manufacturer.
- D. Drive additional ten-foot ground rods spaced ten (10) feet apart if necessary, until total resistance of system is measured at five ohms or less.

**3.14 PERSONNEL INSTRUCTION**

- A. Building Personnel Instruction: Instruct the City of New York's building personnel in procedures for testing and determining resistance-to-ground values of the grounding system. Also instruct personnel in preparation and application of chemical solution for earth surrounding grounding rods for reducing ohmic resistance to the required levels.

**END OF SECTION 26 05 26**



**Department of  
Design and  
Construction**

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**SECTION 26 05 33  
RACEWAYS AND BOXES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide raceways, fittings, boxes, enclosures, and cabinets for electrical wiring in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Rigid Steel Conduit.
- B. Rigid Aluminum Conduit.
- C. Electrical Metallic Tubing (EMT).
- D. Armor Clad (AC) Cable.
- E. Flexible Metal Conduit.
- F. Liquid-Tight Flexible Metal Conduit.
- G. Rigid Non-Metallic Conduit.
- H. Conduit Fittings.
- I. Wireways and Auxiliary Gutters.
- J. Outlet, Junction, Cable Support Boxes and Pull Boxes.



K. Identification Labels.

#### **1.4 SUBMITTALS**

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

B. Shop Drawings

1. Full erection drawings where wireways and/or auxiliary gutters are employed. Drawings shall include plan views, elevations, size of wireways, type and quantity of conductors proposed to be installed therein, etc.
2. Indicate duct banks on multi-trade coordinated shop drawings.
3. Indicate all cable support boxes on all submittals.

C. Product Data

1. Submit dimensioned detailed drawings for boxes exceeding 24 inches in any one (1) dimension.
2. Submit manufacturer's catalog data for all raceways, fittings, enclosures, cabinets, floor boxes and accessories.

#### **1.5 QUALITY ASSURANCE**

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Rigid Steel and PVC Coated Rigid Galvanized Steel Conduit:
  - a. U.L. Standard 6.
  - b. ANSI C80-1 Conduit.
  - c. ANSI C80.4 Fittings.
  - d. NEMA RN-1 2005.
2. Rigid Aluminum Conduit:
  - a. ANSI C80-5.
3. Electrical Metallic Tubing:
  - a. U.L. Standard 797.



- b. ANSI C80.3.
- 4. Armor Clad Cable:
  - a. U.L. Standard 4.
  - b. Federal Specification J-C-30B.
  - c. NEC Article 333.
- 5. Flexible Metal Conduit:
  - a. U.L. Standard 1.
- 6. Liquid-Tight Flexible Metal Conduit:
  - a. U.L. Standard 360.
  - b. UL514B Conduit, Tubing and Cable Fittings.
  - c. UL 1660 Liquid Tight Flexible Nonmetallic Conduit.
- 7. Rigid Non-Metallic Conduit:
  - a. U.L. Standard 651.
  - b. ANSI Standard F512.
  - c. NEMA Standard TC-2.
  - d. Corps of Engineers Specification CE-303:01.
- 8. Wireways and Auxiliary Gutters:
  - a. U.L. Standard UL-870.

## **PART 2 - PRODUCTS**

### **2.1 RACEWAYS**

- A. Rigid Steel Conduit
  - 1. Rigid steel conduit shall be heavy wall, galvanized type.
- B. PVC Coated Galvanized Rigid Steel Conduit



1. PVC coated galvanized rigid steel conduit shall fully comply with all sections of UL6, NEMA RN-1 2005 and ANSI C80.1 without exception. PVC coated galvanized conduit shall have hot dipped galvanized threads. The external PVC coating shall be a nominal 40 mils of external PVC coating and 2 mils of internal urethane coating. The PVC coating shall be applied by the same manufacturer of the hot dipped galvanized rigid steel conduit.
2. The galvanized coating of the hot dipped galvanized conduit shall not be disturbed in any fashion prior to the application of the PVC coating in accordance to UL6 and NEMA RN-1 2005 3.1.1.
3. The PVC coated galvanized rigid steel conduit shall comply with all UL listings, providing the hot dipped galvanized coating as the primary means of protection for the conduit and the PVC coating shall be listed as a secondary means of corrosion protection as required by UL6 and NEMA RN-1 2005.
4. All PVC coated galvanized conduit bodies and fittings shall also be manufactured with 40 mils of PVC coating and 2 mils of internal urethane. All conduit bodies shall be NEMA 4X Rated with encapsulated stainless steel screws.
5. Manufacturers
  - a. Calbond
  - b. Thomas & Betts – OCAL
  - c. Rob Roy Industries – Plasti Bond
  - d. Or approved equal

**C. Rigid Aluminum Conduit**

1. Rigid aluminum conduit shall be heavy wall type.
2. Manufacturers
  - a. Allied Tube & Conduit
  - b. Wheatland Tube
  - c. Carlon
  - d. Or approved equal

**D. Electrical Metallic Tubing**

1. Continuous, seamless tubing galvanized or sheradized on exterior, coated on interior with smooth hard finish of lacquer, varnish or enamel.
2. Manufacturers



- a. Republic Conduit
  - b. Wheatland Tube
  - c. Western Tube
  - d. Or approved equal
- E. Armor Clad Cable
1. Conductors rated at 90°C as specified elsewhere herein, uninsulated ground wire, moisture and fungi resistant fillers, and an interlocking steel armor shield.
  2. Manufacturers
    - a. AFC Cable
    - b. Southwire
    - c. General Cable
    - d. Or approved equal
- F. Flexible Metal Conduit
1. Single strip, continuous, flexible interlocked double-wrapped steel, galvanized inside and outside forming smooth internal wiring channel.
- G. Liquid-Tight Flexible Metal Conduit
1. Liquid Tight flexible metal conduit shall have external PVC jacket and shall be UV stable and shall be machine tool grey in color. Internal construction shall be light-weight aluminum core.
  2. Manufacturers
    - a. OZ Gedney / A Division of Emerson
    - b. Hubbell Raco
    - c. Thomas & Betts
    - d. Or approved equal
- H. Rigid Non-Metallic Conduit
1. Composed of polyvinyl chloride suitable for 90°C.



2. Raceway, fittings and cement must be produced by same manufacturer who must have had minimum of ten (3) years' experience in manufacturing the products.
3. Materials must have tensile strength of 7,000-7,200 psi at 73.4°F, flexural strength of 12,000 psi and compressive strength of 9,000 psi.
4. Manufacturers
  - a. Allied Tube
  - b. Carlon
  - c. Wheatland Tube
  - d. Or approved equal

## **2.2 CONDUIT FITTINGS**

- A. Rigid Steel Conduit
  1. Threaded type fittings.
- B. Rigid Aluminum Conduit
  1. Threaded type fittings.
- C. Conduit Expansion Joints and Deflection Fittings, Rigid Galvanized Steel Conduit. Weather tight, internal ground, expansion joint for galvanized rigid steel conduit.
  1. Manufacturers: All fittings shall comply with UL, NEMA and ANSI Standards as shall be provided by same manufacturer as approved conduit type manufacturers.
    - a. Crouse Hinds / A Division of Cooper Industries – Type XJG & XD
    - b. OZ Gedney / A Division of Emerson – Type AX & DX
    - c. Thomas & Betts – Type XJG & XD
    - d. Or approved equal
- D. Electrical Metallic Tubing
  1. 2½-inch in size and larger may be set screw type. 2-inch in size and smaller, steel compression gland.
  2. In slab or concrete work, concrete-tight fittings.



- E. Armor Clad Cable
  - 1. Malleable iron or die-cast zinc with insulating bushing.
- F. Flexible Metal Conduit
  - 1. Compression-type metal fittings.
- G. Liquid-Tight Flexible Metal Conduit
  - 1. Body, gland and lock nut shall be steel of malleable iron. Ground cone shall be steel, sealing ring and insulator shall be blue molded thermoplastic rated at 150°C (221°F) maximum.
- H. Rigid Non-Metallic Conduit
  - 1. Solvent cemented type.
- I. Manufacturers: All fittings shall comply with UL, NEMA and ANSI Standards as shall be provided by same manufacturer as approved conduit type manufacturers.
  - a. Crouse Hinds / A Division of Cooper Industries – Type XJG & XD
  - b. OZ Gedney / A Division of Emerson – Type AX & DX
  - c. Thomas & Betts – Type XJG & XD
  - d. Or approved equal

### **2.3 WIREWAYS AND AUXILIARY GUTTERS**

- A. Wireways and gutters shall be of sizes and shapes indicated on the Contract Documents and as required to meet the field conditions. Equipment shall be sheet metal, with enamel finish, NEMA 250 rated.
- B. Provide all necessary elbows, tees, connectors, adaptors, etc.
- C. Provide hinged cover secured with captive screws.
- D. Wire retainers shall be provided not less than twelve (12) inches on center.
- E. Manufacturers
  - 1. Square D
  - 2. Wiremold/Legrand
  - 3. Hubbell
  - 4. Or approved equal



## 2.4 OUTLET, JUNCTION AND PULL BOXES

### A. Cast Type Conduit Boxes, Outlet Bodies, and Fittings

1. For rigid steel conduit, ferrous alloy box with inside threaded hubs.
2. For rigid aluminum conduit, aluminum box with inside threaded hubs.
3. For electrical metallic tubing, ferrous alloy box with compression or inside threaded hubs with adapter.
4. Covers: Cast or sheet metal unless otherwise required.
5. Tapered threads for hubs.

### B. Galvanized Pressed Steel Outlet Boxes

1. General: Pressed steel, galvanized or cadmium-plated, minimum of 4" octagonal or square with galvanized cover or extension ring as required.
2. Concrete Box: 4" octagon with removable backplate and 3/8" fixture stud, if required. Depth of box shall allow for a minimum of 1" of concrete to be poured above the backplate.
3. Switch and Receptacle Box; Indoors: Nominal 4" square, 1½" or 2-1/8" deep as required, with raised cover unless otherwise indicated on the Contract Documents.
4. Lighting Fixture Box:
  - a. 4" octagon with 3/8" fixture stud.
  - b. For suspended ceiling work, 4" octagon with removable backplate where required, and two (2) parallel bars for securing to cross-furring channels and extend flexible metal conduit to each fixture.

### C. Sheet Steel Boxes Indoors

1. No. 12 USS gauge sheet steel for boxes with a maximum side less than 40 inches, and a maximum area not exceeding 1,000 square inches; riveted or welded 3/4 inch flanges at exterior corners.
2. No. 10 USS gauge sheet steel for boxes with a maximum side 40 to 60 inches, and a maximum area 1,000 to 1,500 square inches; riveted or welded 3/4 inch flanges at exterior corners.
3. No. 10 USS gauge sheet steel riveted or welded to 1½" by 1½" by ¼" welded angle iron framework for boxes with a maximum side exceeding 60 inches and more than 1,500 square inches in area.
4. Covers:
  - a. Same gauge steel as the box.



- b. Subdivided single covers so no section of the cover exceeds 50 pounds.
  - c. Machine bolts, machine screws threaded into tapped holes or sheet metal screws as required; maximum spacing of 12 inches.
5. Paint: Rust inhibiting primer; ANSI No. 61 light gray finish coat.
- D. Pull and Splice Boxes, Outdoors
- 1. Aluminum reinforced, with removable covers secured by stainless steel machine screws.
- E. Junction Box, Sidewalk Type
- 1. Cast iron, hot-dipped galvanized with threaded conduit entrance hubs, flanged, reinforced checkered cover, gasketed with pry bar slots and countersunk stainless steel screws.
- F. Manufacturers:
- 1. Cooper Industries
  - 2. Appleton Electric Company / A Division of Emerson
  - 3. Erickson Electrical Equipment Co.
  - 4. Hoffman
  - 5. Hubbell / RACO
  - 6. OZ Gedney / A Division of Emerson
  - 7. Thomas & Betts / Steel City
  - 8. Or approved equal
- G. Floor Boxes
- 1. General:
    - a. Class I, UL 514B Rated watertight, normal depth cast iron construction Type I, fully adjustable, for use in concrete.
    - b. Single Gang: Round type.
    - c. Multiple Gang or Combination: Rectangular type: partitions for separating power from communication sections.



2. Floor Box Covers:

- a. Rugged construction, impervious to cleaning detergents.
- b. Compatible with floor covering.
- c. Finish as approved by the Commissioner. Satin Aluminum metallic finish minimum or approved equal by the Commissioner.
- d. Providing continuous ground path to the box.
- e. Cover plates shall accept duplex power receptacles and communication devices to match the Contract Documents.
- f. All cover plates shall be equipped with flip up lids.

3. Manufacturers:

- a. Single or Double Gang for duplex receptacle and/or communication devices: Round with four (4) 1 inch hubs and single flush or double cover.
  - 1) Hubbell
  - 2) Thomas & Betts – Steel City
  - 3) Wiremold/Legrand
  - 4) Or approved equal
- b. Single Gang for Communication devices: Round with four (4) 1¼" hubs and single flush cover.
  - 1) Hubbell
  - 2) Thomas & Betts – Steel City.
  - 3) Wiremold/Legrand
  - 4) Or approved equal
- c. Multi-gang with Interior Partitions and ¾ Inch Hubs:
  - 1) Hubbell
  - 2) Thomas & Betts – Steel City
  - 3) Wiremold/Legrand
  - 4) Or approved equal



- d. Single Gang Rectangular Covers for Multi-Gang Boxes:
  - 1) Hubbell
  - 2) Thomas & Betts - Steel City
  - 3) Wiremold/Legrand
  - 4) Or approved equal
- e. Dual service round floor box with ¾" and 1½" conduit hubs:
  - 1) Hubbell
  - 2) Thomas & Betts – Steel City
  - 3) Wiremold/Legrand
  - 4) Or approved equal

## **2.5 IDENTIFICATION LABELS**

- A. Plasticized Cloth
  - 1. Non-conductive.
  - 2. Waterproof.
  - 3. Capable of withstanding continuous temperatures of 235°F and intermittent temperatures to 300°F.
  - 4. Overcoating for protection against oil, solvents, chemicals, moisture, abrasion and dirt.
- B. Heavy, thermo-resistant industrial grade adhesive for adhesion of label to any surface without curling, peeling, or falling off.
- C. Legends: Sharp, bold-face, two (2) inch black letters on "Alert" orange background.
- D. Label Designations, Nominal System Voltages
  - 1. 208 volts
  - 2. 240 volts
  - 3. 460 volts
  - 4. 480 volts



- 5. 2,400 volts
- 6. 4,160 volts
- 7. 12,400 volts
- 8. 13,200 volts
- 9. 13,800 volts

**E. Manufacturers**

- 1. W.H. Brady Company
- 2. Thomas & Betts Corporation
- 3. DYMO
- 4. Or approved equal

**PART 3 - EXECUTION**

**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

**3.2 APPLICATION OF RACEWAYS**

- A. The following applications must be adhered to. Raceways not conforming to this listing must be removed and replaced with specified material.

Raceway Types	Applications
Rigid Steel Conduit	Where exposed to mechanical injury, where specifically required; indoors where exposed to moisture; for all circuits in excess of 600 volts. Outdoor locations, sump and ejector pits, elevator pits, loading docks, garage, window washing equipment, and service feeders. Fire pump feeders concrete encased with 2" of concrete when Mineral Insulated (MI) Cable is not used.
PVC Coated Rigid Galvanized Steel Conduit	Where exposed to extreme outdoor and indoor corrosion and or weather conditions: Bridges, Water Treatment, Food and Beverage processing. Stub out of Concrete applications. In applications where two (2) UL Listed Layers of Corrosion



<b>Raceway Types</b>	<b>Applications</b>
	protection is required and Hot Dipped Galvanized Conduit as Primary Protection is listed PVC Coating is listed as Primary Corrosion is also UL Listed.
Rigid Aluminum Conduit	For 400 Hz feeders and branch circuits. Outdoor locations.
E.M.T.	Use in every instance except where another material is not specified.
Armor Clad Cable	Lighting and receptacle branch circuits concealed in dry hollow spaces of a building. May not be used in corridors, places of assembly, or where prohibited by Codes and Standards referenced in Article 1.5, Quality Assurance.
Flexible Metal Conduit	Use in dry areas for connections to lighting fixtures in hung ceilings, connections to equipment installed in removable panels of hung ceilings; at bus duct takeoffs; at all transformer or equipment raceway connections where sound and vibration isolation is required.
Liquid-Tight Flexible Metal Conduit	Use in areas subject to moisture where flexible metal conduit is unacceptable, at connections to all motors, and all raised floor areas.
Rigid Non-Metallic Conduit	Schedule 40 - Where raceways are in a slab below grade levels; for raceway duct banks. Schedule 80 - For underground raceways outside of the building which are not encased in concrete.
Wireways and Auxiliary Gutters	Where indicated on the Contract Documents and as otherwise specifically required.

**3.3 RACEWAY SYSTEMS IN GENERAL**

- A. Provide separate raceways for all wiring systems, including security, data, paging, low voltage et al. Emergency system wiring must be kept independent of the normal system wiring. Provide grounding conductor within all circuits. Minimum size 3/4-inch for home runs and 1-inch minimum for power distribution. Wiring of each type and system must be installed in separate raceways.
- B. Install capped bushings on the raceways as soon as they are installed and remove only when cables are pulled. Securely tie embedded raceway in place prior to embedment. Raceways installed below or in floor slabs must extend a minimum of four (4) inches above the finished slab to the first connector. Lay out work in advance to avoid excessive concentrations of multiple raceway runs.



- C. Locate raceways so that the strength of structural members are unaffected and they do not conflict with services of other trades. Install 1-inch or larger raceways in or through structural members (beams, slabs, etc.) only when and in a manner accepted by the Commissioner. Draw up couplings and fittings full and tight. Protect exposed threads from corrosion with one (1) coat of zinc chromate after installation.
- D. Provide raceway installation (with appropriate seal-offs, explosion-proof fittings, etc.) in special occupancy area, as required. Provide conduit seal-offs where portions of the interior raceway system pass through walls, ceiling or floors which separate adjacent rooms having substantially different maintained temperatures, as in refrigeration or cold storage rooms.
- E. Provide labeled pull wire in all spare or empty raceways. Allow five (5) feet of slack at each end and in each pull box. Tag both ends of the cable denoting opposite and termination location with black india ink on flameproof linen tag.
- F. Above Grade: Defined as area above the finished grade for the building exterior and above the top surface of any slabs (or other concrete work) on grade for the building interior.
1. Install concealed except at surface cabinets and for motor and equipment connections in electrical and mechanical rooms. Install a minimum of six (6) inches from flues, steam pipes, or other heated lines. Provide flashing and counter-flashing for waterproofing of raceways, outlets, fittings, etc., which penetrate the roof. Route exposed raceways parallel or perpendicular to the building lines with right-angle turns and symmetrical bends. Run concealed raceways in direct line and, where possible, with long sweep bends and offsets. Maximum length of six (6) feet for flexible metal conduit. Each section of flexible metal conduit shall contain bonding ground connector bonded at each end and sized as required. Provide connectors with insulating bushings. Provide sleeves in the forms for new concrete walls, floor slabs and partitions for passage of the raceways. Waterproof sleeved raceways where required.
  2. Provide raceway expansion joints for exposed and concealed raceways with necessary bonding ground conductor at building expansion joints and between buildings or structures and where required to compensate for raceway or building thermal expansion and contraction. Provide expansion fittings every 200 feet of conduit.
  3. Provide one (1) empty 3/4-inch raceway for each three (3) spare unused poles or spaces of each flush-mounted panelboard. Terminate empty 3/4 inch conduits in a junction box, which after completion is accessible to facilitate future branch circuit extension. Provide pull lines in each raceway.
- G. Below Grade: Defined as area below the finished grade for the building exterior and below or within the bottom floor slab for the building interior. Below grade raceways shall comply with the following:
1. Extend below-grade raceways two (2) inches minimum above the floor or equipment foundation. Install exterior underground conduits 24 inches minimum below the finished grade. Do not penetrate waterproof membranes unless proper seal is provided.
  2. Protect metallic raceway in earth or apply with two (2) coats of asphalt base paint. Touch up abrasions and wrench marks after conduit is in place.



3. In lieu of the above, protect raceways with a minimum of 20 mil tape appropriate for the purpose, overlapped a minimum of one-half tape width.

**H. Duct Banks**

1. Provide duct banks and concrete encasements for both interior and exterior work as indicated on the Contract Documents, for all circuits in excess of 600 volts, for all utility company feeders, and as otherwise indicated.
2. Reinforce duct banks with steel rebars where such duct banks are positioned beneath roads and parking areas.
3. Concrete minimum  $f_c = 3,000$  pounds per square inch.
4. At building walls and at manhole walls, provide raceway of rigid steel, one size larger than the specified raceway, for five (5) feet. Pitch conduit away from the building at every point where the duct bank enters the building or equipment.
5. Support all raceways installed in the duct banks every five (5) feet to assure correct alignment.
6. Terminate raceways with flared bells to enable ease of pulling cable and to eliminate stress on the cable. Free bells and raceway terminations of burrs and rough edges. Mandrel all raceways before the installation of any conductors.
7. Provide concrete markers at grade where duct banks are stubbed out for future use.
8. Install utility duct banks not less than 36 inches below grade to the top elevation.
9. Employ red dye inhibiting agents in the concrete mix for power duct banks.
10. Provide yellow vinyl tracer ribbon twelve (12") inches above each duct bank buried in the backfill.

**I. Fire Pump Raceways**

1. Encase all raceways for the fire pumps in a minimum 2" of concrete. Concrete shall have a red dye.

**J. Install no raceway in the concrete slab except with the written consent of the Commissioner. Maximum conduit sizes embedded in structural concrete slabs:**

Raceway Size	Min. Thickness of Concrete Slab
3/4 in.	4½ in.
1 in.	5 in.

1. Do not install raceways 1¼ inch size and larger in structural concrete slabs.



2. In no case will the installation of raceways be permitted to interfere with proper placement of principal reinforcement.
3. Place raceways in the structural slabs between the upper and lower layers of reinforcing steel. Careful bending of the conduits is required.
4. Space the raceways embedded in concrete slabs not less than eight (8) inches on centers and as widely spaced as possible where they converge at panels or junction boxes.
5. Install raceways running parallel to slabs supports, such as beams, columns and structural walls, not less than 12 inches from such supporting elements.
6. Secure saddle supports for conduit, outlet boxes, junction boxes, inserts, etc. with suitable adhesives during concrete pour of the slab to prevent displacement.

**K. Rigid Non-Metallic Raceway**

1. All joints shall be made by solvent cementing method using material recommended by the raceway manufacturer. Clean components prior to assembly. Supply fittings, cement and conduit shall be by the same manufacturer.
2. Square raceway cutoffs made by handsaw or other appropriate means which does not deform the conduit. Ream raceway prior to solvent cementing to couplings, adaptors, or fittings.
3. Ground electrical devices served by rigid non-metallic raceways by means of a ground conductor pulled in the raceway.
4. Use male box adapters for all box or raceway fittings to terminate rigid non-metallic raceways.
5. Where separable terminations are required, make using rigid non-metallic threaded adapters with locknuts or bushings. If such terminations must be watertight, install "O" rings.
6. Make bends by methods that do not deform or damage the conduit. Radii of field bends shall not be less than those established by the N.E.C.
7. Provide raceway expansion fittings where necessary. Adjust position of expansion fitting proportional to the temperature at the installation.
8. Install raceway supports to allow the rigid non-metallic conduit to slide through supports as temperature changes.
9. Use galvanized rigid steel conduit elbows at all bends.



**L. PVC Coated Rigid Galvanized Conduit**

1. All restoration and patching to PVC Coated Rigid Galvanized Steel Conduit, shall be in accordance with manufacturers recommendations. Contractors shall use manufacturer's patch and repair kits in order to guarantee certified products are used and compliance with all factory warranty guidelines are met.

**M. Raceways in hung ceilings shall be installed on and secured to the slab or primary structural members of the ceiling, not to lathing channels or T-bars, Z-bars or other elements which are direct supports of the ceiling panels. Secure conduit firmly to the steel with clips and fittings designed for that purpose. Install as high as possible but not less than 1'-0" above the hung ceilings.**

**N. Install exposed raceways parallel or at right angles with building lines. Secure raceway clamps or supports to masonry materials by toggle bolts, expansion bolts, or steel inserts. Install raceways to steel construction with appropriate clamps which do not depend on friction or set-screw pressure alone.**

**O. Clear raceways of all obstructions and dirt prior to pulling in cables. Use ball mandrel (diameter approximately 85% of the conduit inside diameter) followed by close fitting wire brush and wad of felt or similar material. This assembly may be pulled in together with, but ahead of any cable being installed. Clean all empty raceways similarly. Clear any raceway which rejects ball mandrel, then re-attempt mandrel application.**

**P. Support vertically installed raceways less than 2" trade size at intervals no greater than eight (8) feet. Support such raceways 2" trade size or larger and made up with threaded couplings, at intervals no greater than story height, or fifteen (15) feet, whichever is smaller.**

**Q. Support horizontally installed raceways less than 1" trade size at intervals no greater than six (6) feet. Support such raceways 1" trade size or larger, at intervals no greater than ten (10) feet.**

**3.4 WIREWAYS AND AUXILIARY GUTTERS**

- A. Place wireways installed in hung ceilings such that the covers will hinge upward from the side.**

**3.5 OUTLET, JUNCTION, AND PULL BOXES**

- A. Provide outlet, junction, and pull boxes as indicated on the Contract Documents and as required for the complete installation of the various electrical systems, and to facilitate proper pulling of the cables. Size the junction boxes and pull boxes per the NEC. Size the boxes on any empty conduit systems as if containing conductors of No.4 AWG.**

- B. The exact location of outlets and equipment is governed by the structural conditions and obstructions, or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to the room layout and will not interfere with other work or equipment. Verify final location of outlets, panels equipment, etc., with the Commissioner prior to installation.**

- C. Back-to-back outlets in the same wall, or "thru-wall" type boxes are not permitted. Provide 12-inch minimum spacing for outlets shown on opposite sides of a common wall to minimize sound transmission.**



- D. Fit outlet boxes in finished ceilings or walls with appropriate covers, set flush with the finished surface. Where more than one (1) switch or device is located at one (1) point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes are not permitted. Provide tile box or 4 inch square box with tile ring in masonry walls not plastered or furred. Where drywall material is utilized, provide plaster ring. Provide outlet boxes of type and size suitable for the specific application. Where devices occur of different applied voltages, or where normal and emergency devices occur in the same box, provide suitable barrier(s).
- E. All outlet and device box depths shall have sufficient depth to prevent damage to the conductors when devices or utilization equipment are installed as intended in the box.
- F. Types of Boxes and Fittings for Various Locations

Location	Type
Outlet	Galvanized pressed steel
Outlet exposed to moisture or outdoors	Cast type conduit fitting
Splice	Galvanized pressed steel
Splice exposed to moisture or outdoors	Cast type conduit fitting or sheet metal (4½" x 5" x 3" minimum)
Pull or Junction	Cast type conduit fitting or sheet metal (4½" x 5" x 3" minimum)
Pull or Junction - Outdoors	Aluminum (4½" x 5" x 3" minimum)
Terminal	Sheet steel (6" x 6" x 3" minimum)
Terminal - Outdoors	Aluminum (6" x 6" x 3" minimum)

- G. Pull Box Spacing
  - 1. Provide pull boxes so no individual conduit run contains more than the equivalent of four (4) quarter bends (360° total).
  - 2. Conduit Sizes 1¼" and Larger:
    - a. Provide boxes to prevent cable from being excessively twisted, stretched or flexed during installation.
    - b. Provide boxes so that maximum pulling tensions do not exceed the cable manufacturer's recommendations.
    - c. Provide support racks for boxes with multiple sets of conductors so that the conductors do not rest on any metal work inside the box.



3. Conduit Sizes 1 Inch and Smaller, provide boxes at every (Maximum Distances):
  - a. 150 feet: Straight runs
  - b. 100 feet: Runs with one (1) 90° bend or equivalent
  - c. 75 feet: Runs with two (2) 90° bends or equivalent
  - d. 50 feet: Runs with three (3) or (4) four 90° bends or equivalent.

**H. Sheet Steel Boxes**

1. Boxes shall be sized to permit pulling, racking and splicing of the cables (if not indicated on the Contract Documents). They shall be sized to avoid exceeding the manufacturer's minimum bending radius recommendations for the conductors.
2. Provide access for the removal and replacement of the conductors, splices and equipment.
3. Minimum Dimensions of Boxes in Runs of 1½" or Larger Conduit:
  - a. Straight Pulls: Size length eight (8) times nominal diameter of the largest conduit.
  - b. Angle or U-Pulls: Size such that the distance between the conduit entry and the opposite wall of box is six (6) times the nominal diameter of the largest conduit.
4. For boxes containing over 600V conductors, provide insulated cable supports and removable steel barriers to isolate each feeder. Stencil cable voltage class in red letters on the front cover of the box.
5. Covers: Fasten to the flange or framework of the box with machine bolts, machine screws threaded into tapped holes or sheet metal screws as required.
6. Plug any open knockouts not utilized.

**I. Pull and Splice Boxes, Outdoors**

1. Where size of the box is not indicated, size to permit pulling, racking and splicing of cables being installed.
2. Braze ground connector suitable for copper cables to the inside of the box.

**J. Floor Boxes**

1. Prior to the Concrete Pour:
  - a. Orient as shown on the Contract Documents and obtain approval from the Commissioner.
  - b. Firmly support all boxes.



- c. Adjust leveling screws to ensure that the box covers will be flush with the finished floor.
  - d. Plug unused openings with proper fittings and seal joints with a compound for exclusion of concrete and moisture.
2. After the Concrete Pour:
- a. As soon as traffic is permitted on the slab, remove any accumulation of water and foreign matter to avoid corrosion and rust.
  - b. Insure covers are flush with the finished floor.
  - c. Install cover plates and accessories after floor finishing materials have been installed; refer to the Contract Documents for requirements for the types of covers.
- K. Identification labels for all pull, splice and junction boxes in main feeder and subfeeder runs, shall indicate nominal system voltage:
1. Apply labels after painting of any boxes, conduits, and surrounding areas are completed.
  2. Clean surfaces before applying labels; clean aluminum surfaces with solvent wipe.
  3. Apply labels on the cover and a minimum of one (1) fixed side; one (1) label visible from the floor where the boxes are installed exposed.

### **3.6 FIRE PUMP AND SERVICE ENTRANCE RACEWAYS**

- A. Use rigid steel heavy-wall conduits.
- B. Encase in concrete with a minimum of 2" of cover.
- C. Utilize red dye in the fire pump duct bank.

### **3.7 SLEEVES**

- A. Where sleeves are required for the installation of electrical work passing through walls or floors, furnish and install under this Section of Specification unless indicated otherwise on the Contract Documents. Use galvanized or black enameled rigid steel conduit or Schedule 40 black steel pipe. Do not use aluminum conduit. Where specific sizes are not indicated on the Contract Documents, size sleeves shall provide ½ inch clearance around the outside surface of the item for which installed. Cut flush with the wall surfaces and extend two (2) inches above the finished floor level or as indicated on the Contract Documents. In mechanical rooms, extend sleeve four (4) inches above the finished floor level.
- B. For interior walls and for floors, pack space between the conduit, ground cable or similar items and sleeves to the full depth of the wall or slab thickness with fire stopping material to maintain the required rating.



**3.8 CABLE SUPPORT BOXES**

- A. Cable support boxes shall be installed and of dimensions as required by the NEC. These boxes shall be built of steel or aluminum with removable cover secured by brass machine screws and shall be stiffened with heavy angle irons. Cable supports shall be OZ type "S". Boxes must in all ways be satisfactory to the Commissioner and subject to his/her approval. Provide ground lug in the box, secured by welding or brazing. Submit shop drawings for approval.

**END OF SECTION 26 05 33**



**Department of  
Design and  
Construction**

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**SECTION 26 05 53  
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide fixed identification of all distribution equipment and conductors in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Fixed identification for:
1. Panelboards.
  2. Transformers.
  3. Disconnect Switches/Enclosed Circuit Breakers.
  4. Motor Controllers.
  5. Wall Plates.
  6. Pullboxes, Enclosures and Cable Terminations.
  7. Fire Alarm Panels.
  8. Capping and Staking.
  9. Luminaires.



**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Identification procedures shall be noted and scheduled on the applicable shop drawings.
- C. Provide samples to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of all identification products.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  - 1. Industry standards shall apply.
  - 2. NFPA 70.
  - 3. ANSI A13.1 ANSI Z535-4.
  - 4. 29 CFR 1910.144/29 CFR 1910.145
  - 5. OSHA Standards.
  - 6. IEEE C2-2017
  - 7. UL 969

**PART 2 - PRODUCTS**

- 2.1 Unless otherwise noted, nameplates shall be black bakelite plates with white engraved upper case letters enclosed by white border on beveled edge.
- 2.2 Nameplates for equipment supplied by the emergency system shall be red bakelite with white lettering.
- 2.3 All nameplates must be engraved and must be secured with rivets, brass or cadmium plate screws. The use of vinyl type adhesives or the like is unacceptable.
- 2.4 Lettering heights unless otherwise noted must be as follows:

Item	Lettering Height
Panelboards	1/2"
Disconnect Switches/Enclosed Circuit Breakers	1/2"



Item	Lettering Height
Motor Controllers	1/4"
Wall Plates	1/8"
Pullbox, Enclosures and Cable Terminations	1/8"
Fire Alarm Panels	1/2"
Capping and Staking	1/2"
Luminaires	1/2"

- 2.5 Cable tags must be flameproof and secured with flameproof non-metallic cord.
- 2.6 Nameplate inscriptions must bear the name and number of the equipment to which they are attached as indicated on the Contract Documents. The Commissioner reserves the right to make modifications in the inscriptions as necessary.
- 2.7 The Commissioner reserves the right to request additional nameplates at the time of review of shop drawings and upon site observations.
- 2.8 Do not manufacture or install nameplates until approved by the Commissioner.
- 2.9 Apply adhesive identification labels after work is completed and all surfaces have been properly cleaned.
- 2.10 WARNING LABELS AND SIGNS**
- A. Provide and comply with NFPA 70 and 29 CFR 1910.145.
- B. Metal-back, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized steel backing; and with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 10 by 14 inches.
- C. Warning Label and sign shall include, but not be limited to, the following legends:
1. Multiple Power Source Warning: "DANGER-ELECTRICAL SHOCK HAZARD EQUIPMENT HAS MULTIPLE POWER SOURCES"
  2. Workspace Clearance Warning: "WARNING – OSHA REGULATION – AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."





**3.6 PULLBOXES, ENCLOSURES AND CABLE TERMINATIONS**

- A. Furnish and install cable tags on each cable which enters a pullbox, enclosure, panelboard, switchboard and at terminations. Mark tags with type written inscription noting the load served, type and size of cable and the overcurrent device protecting the cable.

**3.7 FIRE ALARM PANELS**

- A. Furnish and install on each fire alarm panel an approved nameplate.
- B. Nameplates shall indicate floor and where multiple panels are installed a prime designation for each cabinet (e.g. DGP-1A, DGP-1B) per the shop drawings marked "NO EXCEPTIONS NOTED."
- C. Panels shall be permanently identified in an approved manner.
- D. Provide additional fire alarm devices labeling as indicated in the fire alarm specification section.

**3.8 CAPPING AND STAKING**

- A. Wherever raceways are for future use and are terminated outside of the structure, stake the location with a 2' long 1" x 1" wooden stake having a conspicuous colored flag.
- B. Provide metal markers inserted into 8" D x 12" concrete ballast at all raceway terminations exterior to the structure. Inserts must state the date the raceway was installed, the size of the raceway and the point of the raceway termination.
- C. Indicate exact location on as-built documents.

**3.9 LUMINAIRES**

- A. Where connected to other than 120 Volt circuit, provide each luminaire fixture with the ballast voltage stenciled on the ballast cover in letters not less than 1/2 inch high.

**END OF SECTION 26 05 53**



**Department of  
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**SECTION 26 08 00**  
**COMMISSIONING OF ELECTRICAL**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This section includes commissioning process requirements for Electrical systems, assemblies, and equipment.
- B. Related Sections:
1. DDC General Conditions Section "General Commissioning Requirements" for general commissioning process requirements.

**1.3 DESCRIPTION**

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the installing contractors to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

**1.4 DEFINITIONS**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for definitions.



## 1.5 SUBMITTALS

- A. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.
- B. The CxA will receive a copy of the final approved submittals.
- C. In addition, the contractor is to provide the following:
  - 1. Certificates of readiness
  - 2. Certificates of completion of installation, prestart, and startup activities.
  - 3. O&M manuals
  - 4. Test reports
- D. Refer to DDC General Conditions Section "General Commissioning Requirements" for general commissioning submittal requirements.
- E. Refer to DDC General Conditions "Submittal Procedures" for all submittals.

## 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. Commissioning Kick-Off Meeting – Construction Team: Contractors will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.
- B. Commissioning Meetings: Contractors will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.
- C. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process.



- D. Pre-testing Meetings: Contractors will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested.
- E. Testing: Contractors will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: Contractors will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: Contractors will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT**

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the 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. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 GENERAL DOCUMENTATION REQUIREMENTS**

- A. With assistance from the installing contractors, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems



- B. Red-lined Drawings (As-Built): The contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The contracted party, as defined in the Contract Documents will create the as- built drawings.
- C. Operation and Maintenance Data: Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.
- D. Demonstration and Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. A orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientationsession

### **3.3 CONTRACTOR'S RESPONSIBILITIES**

- A. Refer to DDC General Conditions Section "General Commissioning Requirements" for general contractor's responsibilities.
- B. Attend construction phase controls coordination meetings.
- C. Provide information requested by the CxA for final commissioning documentation.
- D. Prepare preliminary schedule for Electrical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, equipment start-up and task completion for The City of New York. Distribute preliminary schedule to commissioning team members.
- E. Provide measuring instruments and logging devices to record test data, and provide data acquisition equipment to record data for the complete range of testing for the required test period.
- F. Provide detailed startup procedures.
- G. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications
- H. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- I. Respond to provided new deficiencies and/or responses within five (5) business days
- J. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the specifications. Submit to CxA 45 days after submittal acceptance.
- K. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.



- L. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.
- M. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-system are operating as required.
- N. Electrical equipment including existing motor control centers tie in to all project related equipment furnished under this Division.
  - 1. Fire alarm system
  - 2. CO Detection System
  - 3. Solar panel furnished and installed
- 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. Equipment Suppliers
  - 1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.
  - 2. Assist in equipment testing per agreements with Contractors.
  - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

### **3.4 CXA'S RESPONSIBILITIES**

- A. Roles and Responsibilities
  - 1. Refer to DDC General Conditions Section "General Commissioning Requirements" for general CxA responsibilities.
- B. Cx Team Meetings
  - 1. Commissioning during construction will begin with a 'Commissioning Kick-Off Meeting – for Construction Team' conducted by the CxA where the commissioning process is reviewed with all of the commissioning team members.
  - 2. Additional meetings will be required throughout construction, and will be scheduled by the CxA on a weekly basis with necessary parties of the commissioning team attending, in order to plan, scope, coordinate, and schedule future activities and resolve problems.
- C. Coordination and Scheduling



1. Coordinate and direct commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications, and consultations with all necessary parties.
2. Coordinate commissioning work with the Resident Engineer to ensure that commissioning activities are being scheduled into the master project schedule.
3. Coordinate with the Resident Engineer to witness tests, inspections, and systems startup.

**D. Commissioning Progress**

1. Perform site visits to observe component and system installations.
2. Report deficiencies to the Commissioner including but not limited to issues related adequate accessibility required for component maintenance replacement and repair.
3. Attend selected planning and jobsite meetings to obtain information on construction progress.
4. Review construction meeting minutes for revisions/substitutions relating to the commissioning process.

**E. Pre-Functional Checks**

1. Verify proper installation of components, equipment, systems and assemblies. Sampling procedures may NOT be employed on systems and equipment.

**F. Equipment and System Startup and Verification**

1. Review and approve component, equipment, system, and assembly startup plan developed and submitted by the Contractor.
2. Approve system startup by reviewing startup reports, if contracted; and by selected site observation.
3. Review the Testing, Adjusting and Balancing execution plan for the project, which shall be submitted by the TAB subcontractor.
4. Verify and document the accuracy of the air and water systems balancing by spot testing the air and water reported field values with TAB subcontractors and by reviewing completed reports.

**G. Functional Performance Testing**

1. With assistance from the Contractor, write Functional Performance Testing procedures for all components, equipment or systems to be commissioned.
2. With the assistance of the Contractors, coordinate Functional Performance Testing. Witness and approve Functional Performance Testing performed by the Contractors.
3. With the assistance of the Contractors, coordinate retesting as necessary until satisfactory performance is achieved.



4. Witness seasonal or deferred Functional Performance Testing as necessary.

H. Issue/Deficiency Logs

1. The CxA shall prepare a formal, ongoing, online record of deficiencies, problems and concerns – and their resolution – raised by members of the Commissioning Team during the Commissioning Process.
2. Issues will be recorded on an online Commissioning Issues Log for the contractors to resolve to the satisfaction of the Commissioner. Issues will be added by the CxA. Team members are required to post their own responses to issues pertaining to their work. Team members are required to respond to issues added to the list within five (5) working days of being added by the CxA.
3. Issues will be revisited one (1) time to verify that the proper corrections have been made.
4. When issues are resolved, they will be closed on the Issues Log by the CxA

I. Operation and Maintenance Data

1. The CxA shall review of the documentation submitted by the Contractor as required by the Specifications for completeness and accuracy. This commissioning review supplements, but does not replace, the Commissioner's review.
2. Review equipment warranties.

J. Instruction

1. The Contractor will provide all documentation and qualified instruction personnel for instruction.
2. The CxA will verify through the Contractor's plan and schedule, instruction agendas, and select observations that proper instruction procedures were followed on all commissioned systems.
3. The CxA will verify that Instruction Video Recordings are executed, collected, and provided to the Commissioner and/or appropriate New York City Personnel.
4. See appropriate section below pertaining to instruction.

K. Systems Manual Requirements

1. Index of Systems Manual with notation as to content storage location if not in actual manual.
2. Executive Summary
3. A list of recommended operational record keeping procedures at the facility level, including sample forms, trend logs, or others, and a rationale for each.
4. Maintenance procedures, schedules and recommendations.
5. Ongoing Optimization



6. Other Attachments

L. Post Occupancy Review

1. The CxA will return to the site within the 12-month warranty period to address the following: review current building operations with facility staff and address outstanding issues related to the Owner's Project Requirements; Interview facility staff and identify problems or concerns with operating the building; Identify problems covered under warranty or under the original construction contract.
2. The CxA will make suggestions for improvements in the content of the O&M Manuals. Any required changes shall be made by the contractor responsible for that section.
3. The CxA shall assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

M. Commissioning Final Report

1. The CxA shall provide a final report following the completion of all Functional Performance Testing. The report is to outline compliance and non-compliance to the construction documents, as well as identify concerns relative to future performance.

**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. Electrical Distribution System Testing: Provide technicians, load banks, infrared cameras, instrumentation, tools and equipment to test performance of designated systems and devices at the direction of the CxA. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested
- D. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.



E. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. The following equipment and systems shall be evaluated:

1. Coordination and functionality with the Building Automation System/Building Management Controls System
2. Fire alarm system
3. CO Detection System
4. Solar panel

### **3.8 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT**

A. Deficiencies/Non-Conformance

1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items shall be noted and reported to the Commissioner and Contractors on a standardized form.
2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the contract document in dispute or request further information to clarify the concern.
3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
4. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
5. As tests progress and a deficiency is identified, the CxA discusses the issue with the executing Contractor.
6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function.
7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.



**B. Failure due to Manufacturer Defect**

1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the Contractor, CxA or Commissioner. In such case, the Contractor shall provide the Commissioner with the following.
  - a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
  - b. Within two weeks of the original notification, the Contractor or manufacturer shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
  - c. The Contractor, CxA, or Commissioner will determine whether a replacement of all identical units or a repair is acceptable.
  - d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the CxA or Commissioner will decide whether to accept the solution.
  - e. Upon acceptance, the Contractor and/or manufacturer shall replace or repair all identical items, and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

**3.9 APPROVAL**

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

**3.10 DEFERRED TESTING**

- A. Unforeseen Deferred Testing – If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Commissioner. These tests will be conducted in the same manner as the seasonal tests, as soon as possible. Services of necessary parties will be negotiated.
- B. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate Contractors, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.



### **3.11 OPERATION AND MAINTENANCE MANUALS**

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in DDC General Conditions.
- B. The specific content and format requirements for the standard O&M manuals are detailed in DDC General Conditions. Special requirements for the controls contractor and TAB contractor are found in Division 26.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

### **3.12 INSTRUCTION OF NEW YORK CITY PERSONNEL**

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.
  - 1. The CxA shall interview the City of New York's staff to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor. Who will in turn communicate to the subcontractors and vendors who also have instruction responsibilities.
  - 2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by Contractors, subcontractors and vendors are specified in the individual sections listed in Section 1.2 – SUMMARY.
  - 3. Each Sub and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.
  - 4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:
    - a. Equipment (included in instruction)
    - b. Intended audience
    - c. Location of instruction
    - d. Objectives



- e. Subjects covered (description, duration of discussion, special methods, etc.)
  - f. Duration of instruction on each subject
  - g. Qualified instructor for each subject
  - h. Instructor qualifications
  - i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)
5. For the primary equipment, the Controls Subcontractor shall provide a discussion of the control of the equipment during the instruction conducted by each subcontractor or vendor.
  6. Instruction documentation shall include the following items:
    - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
    - b. Copy of the Owner's Project Requirements.
    - c. Copy of the Basis of Design.
    - d. Compiled operations manuals.
    - e. Compiled maintenance manuals.
    - f. Completed manufacturer instruction manuals.
    - g. Red-lined drawings.
    - h. Other pertinent documents.
  7. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending some of the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.
  8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment
  9. Videotaping of the instruction sessions in DVD format will be provided by the CxA.

**END OF SECTION 26 08 00**



**Department of  
Design and  
Construction**

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**SECTION 26 24 16  
PANELBOARDS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide all panelboards as specified herein and in accordance with the Contract Documents.

**1.3 RELATED DOCUMENTS**

- A. Refer to DDC General Conditions for additional requirements applying to this Section.

**1.4 WORK INCLUDED**

- A. Panelboards.
- B. Circuit Breakers.
- C. Fusible Switches.

**1.5 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
  - 1. Submit manufacturer's data, including main devices and lug sizes; branch circuit device sizes and arrangement; bus ampacities; voltage, ampere, withstand ability, and short circuit rating of the panelboard and overcurrent protective devices; dimensions and construction; gutter and backbox dimensions; nameplate and legend; protective coating; and all pertinent details of panel, enclosure, cover, and method of securing cover and lock.



2. Include fully detailed and dimensioned plan elevations of each panel at a minimum of 1/4" scale.
3. Submit plans indicating maximum dimensions for panelboards including clearances between the panelboards and adjacent surfaces and other items to meet the NEC.
4. Submit wiring diagrams for all panelboards showing all connections to incoming and outgoing feeders.

C. Product Data

1. Submit manufacturer's catalog data for all circuit breakers and switch assemblies.
2. Submit certification of U.L. compliance to integrated short circuit withstand requirements.

**1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and recommendations of the following:
  1. Panelboards:
    - a. U.L. Standards #50 and #67.
    - b. NEMA Standard PB-1.
    - c. CSA Standard C22.2 No. 29-M.
    - d. NFPA 70, 2008 edition.
  2. Circuit Breakers:
    - a. U.L. Standard #489.
    - b. NEMA Standard AB-1.
    - c. CSA Standard C22.2 N. 5-M91.
  3. Fusible Switches:
    - a. U.L. Standard 98.
    - b. NEMA KS-1.
  4. Ground Fault Circuit Interrupters (GFCI):
    - a. UL 943.



- C. Testing Agency Qualifications
  - 1. Member company of NETA and NRTL

## **PART 2 - PRODUCTS**

### **2.1 PANELBOARDS**

- A. Provide panelboards consisting of an assembly of branch circuit switching and protective devices (circuit breakers, switch and fuse units, or combination thereof) mounted inside a dead front enclosure. All panelboards shall be door-in-door construction with Yale lock and 47 key. Provide the number and size of these branch circuit devices as indicated by the circuiting, on the Contract Drawings, and in the Schedules. Locations of circuit breakers shall be as indicated in the schedules.
- B. Provide the following modifications and additional equipment as shown on the Contract Drawings:
  - 1. Main circuit breakers.
  - 2. Shunt trip circuit breakers.
  - 3. Ground fault circuit interrupting (GFCI) circuit breakers.
  - 4. Feed-through lugs and/or bus.
  - 5. Electronic sub-metering CT and wiring.
- C. Interiors
  - 1. Provide a rigid removable assembly of copper bus bars and interchangeable bolted branch circuit devices.
  - 2. Material: Hard-drawn copper, 98 percent conductivity.
    - a. Copper bus bars shall have sufficient cross-sectional area to provide a current density of 1000A per square inch.
  - 3. Bus bars drilled to permit branch circuit devices of all sizes and number of poles to be interchangeable and installed in any spare space of sufficient size, without disturbing adjacent units; without removing main bus or branch circuit connectors and without machining, drilling, or tapping in the field.
  - 4. Bus shall be arranged in sequence or distributed phasing so that a multi-pole circuit breaker can replace any group of single circuit breakers of the same size.
  - 5. Provide full-size neutral bus in each panelboard, unless otherwise noted.



6. Provide ground bus in each panelboard. On 208Y/120 volt panelboards provide isolated ground bus when served from a feeder that includes an isolated ground conductor. Each isolated ground bus shall be capable of terminating one (1) conductor per panelboard pole position minimum.

**D. Enclosure**

1. Enclosure shall be code gauge hot zinc dipped galvanized steel box, in accordance with UL 50 requirements.
2. Provide a bolt-on ground connector to inside of enclosure.
3. Enclosure shall be flush mounted in finished areas and where indicated. Enclosure shall be surface mount elsewhere.
4. Gutter Extension and Barrier: Same gauge and finish as the panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.

**E. Front**

1. Doors shall be provided on all lighting and power panels. On switch and fuse panelboards doors, over overcurrent devices shall not be provided unless rated for same.
2. Doors shall be heavy code gauge galvanized steel as required to maintain panel face flat.
3. Front shall be held closed with trim clamps.
4. Front door frame shall be hinged with captive screws. Circuit breaker section door shall be hinged.
5. Provide as-built typewritten directory for total number of poles. Install behind plastic transparent protective cover on the panel frame.
6. Provide approved lock. All panels shall be keyed alike. Furnish four (4) sets of matching keys to the City of New York.
7. Provided welded angle rest at the bottom of the door to facilitate cover installation.
8. Doors over 48" in height shall have auxiliary fasteners at top and bottom of door in addition to lock and catch.
9. Enclosure shall be factory finished in ANSI 61 gray enamel or two (2) coats of air-drying lacquer over a rust inhibiting primer.

**F. Multiple Section Panelboards**

1. Each section of multiple section panelboards shall be the same height.
2. Multiple sections shall each contain the same number of poles (e.g., 72 poles equals 2-36 pole panels).



3. When a multi-section panel is served from a transformer, the main circuit breaker shall be provided in the first section to adequately protect the transformer secondary.

**G. Terminal Lugs**

1. Terminal lugs shall be bolted type, labeled for either copper or conductors.
2. Main lugs shall be located properly at top or bottom, depending where main feeder enters.
3. Lugs shall be rated for 75°C terminations.

**H. Electrical Ratings**

1. Panelboards shall be rated 208Y/120 volts, 3 phase, 4 wire, full neutral with ampacities as indicated on the Contract Drawings (unless otherwise noted).
2. Panelboards shall be fully rated for the available short circuit current indicated on the Contract Drawings. Each panelboard, as a complete and finished product, shall receive a single U.L. approved integrated equipment rating by the manufacturer. The integrated equipment short-circuit rating shall certify that all equipment is capable of withstanding the thermal and magnetic stress of a fault equal to the value specified on the Contract Drawings. Such rating shall be established by actual tests by the manufacturer on similar equipment. This certification shall be permanently affixed to each panelboard.
3. Where indicated, provide panelboards having a "service entrance" Type U.L. label with neutrals factory bonded to the frame or enclosure.
4. Provide surge protective devices as indicated on the Contract Documents.

**I. Circuit Breaker Devices**

1. Circuit breakers shall be plastic molded case bolt on type with a completely sealed enclosure and toggle type operating handle. Trip ampere rating and "ON/OFF" indication shall be clearly visible. Plug-in type circuit breakers shall not be permitted.
2. Circuit breakers shall be thermal-magnetic trip-free, trip-indicating, quick-make/quick-break, with inverse time delay characteristics. Single-handle and common tripping multi-pole breakers shall be provided.
3. Provide with silver alloy contacts with auxiliary arc-quenching devices.
4. Panelboard shall be of the type which will accept the field installation of shunt trip devices of 60 amperes or less on the branch devices.
5. Interrupting capacities shall be as indicated on the Contract Drawings. As a minimum, 208Y/120 volt devices shall be not less than 10,000 AIC, and distribution style panels not less than 42,000 AIC.
6. For lighting circuits provide devices labeled "SWD" for switching purposes.



7. Provide with bolted type terminals U.L. listed for copper 75°C conductors.
8. Provide main breakers in panels served from transformers unless separate transformer secondary protection is provided. Main circuit breakers shall be provided in the first section only when multi-section panelboards are provided.
9. Each breaker or space unit shall be provided with an individual number.
10. Circuit breakers serving computer equipment and those serving kitchen equipment beneath cooking hoods shall include a shunt trip coil, when a remote break-glass station or EPO is provided.
11. Shunt trip breakers shall be supplied with 120 volt coils. Provide 120-volt circuit from nearest 120-volt panel to coil. Where shunt trip breakers are in emergency panels provide emergency 120-volt source for same from nearest 120-volt emergency panel.
12. Provide handle padlocking device for designated breakers.
13. For HVAC equipment provide U.L. listed "HACR" type devices.
14. Provide tie-bars on all single pole circuit breakers serving multi-wire branch circuits in compliance with NEC Article 210.4(B). The disconnecting means shall simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates.
15. Should fixed in-feeds require more than one (1) branch circuit, all circuit breakers shall be equipped with tie-bars to allow all circuits to be disconnected during maintenance events.

**J. Ground Fault Circuit Interrupters (GFCI)**

1. Ground fault circuit interrupter branch circuit breakers shall be provided as indicated on the Contract Drawings. Circuit breakers shall be circuit interrupting which will operate manually for normal switching functions and automatically under overload, short circuit, and 0.005-amp line-to-ground fault conditions. The operating mechanism shall be entirely trip-free so that contact cannot be held closed against an abnormal overcurrent, short circuit, or ground fault condition. The device shall be bolt-on type with insulated case construction and shall be interchangeable with standard single pole breakers utilized in the panelboard.

**K. Switch and Fuse Devices**

1. Provide a quick-make/quick-break, horsepower rated, dead-front type of switch. Each switch shall be a self-contained unit, externally operable from the front. Provision for padlocking handle in "OFF" position shall be provided.
2. Fuse and switch compartment shall be interlocked to prevent access to the fuse compartment until switch is switched to "OFF" position. Interlock shall be intentionally releasable by externally applied tool to permit investigating switch and fuses under load.



3. Switch units shall be interchangeable for replacement, without disturbing balance of distribution panelboard's operation.
4. Switches shall be equipped with rejection type clips for U.L. Class R fuses up to 600A, suitable for U.L. Class L fuses above 600A.
5. Switches shall reject fuses other than those specified.
6. Provide spare fuses as specified in the fuse specification section.

## **2.2 MANUFACTURERS**

- A. Electrotech
- B. All City Switchboard
- C. Lincoln Electric.
- D. General Electric
- E. Square 'D'
- F. Eaton
- G. Siemens
- H. Or approved equal

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 INSTALLATION**

- A. All panels shall be mounted at a maximum height of six feet six inches to top unless otherwise noted.
- B. Surface type panels shall be mounted a minimum one inch off the wall on channels.
- C. Feed-through panels shall be connected to a main feeder by insulated parallel gutter taps. Full-size tap shall be provided for two (2) or more panels on a common feeder.
- D. Where panels are flush mounted, the fire integrity of the wall in which it is installed shall be maintained. Utilize additional fire rating equipment to maintain wall rating.



- E. Branch circuit conductors shall be neatly arranged and shall be tied together in each gutter with nylon pre-manufactured cable ties at four inch intervals.
- F. All knockouts removed and not utilized shall be plugged.
- G. Provide nameplate and fill out as-built typewritten panel directory.
- H. Provide grounding and bonding jumpers per the grounding specification section herein and as indicated on the Contract Drawings.
- I. All branch circuit conductors, within panelboards, shall be labeled with respective circuit number.
- J. Stub three (3)-1" empty conduits from each recessed panelboard into the ceiling cavity above for future use.
- K. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

### **3.3 TOUCH UP AND CLEANING**

- A. All backboxes shall be vacuumed clean of debris after installation and prior to final payment.
- B. Scratch marks, etc., shall be touched up with matching paint.

### **3.4 OBSERVATIONS**

- A. Panel fronts shall be removed when directed by the Commissioner for observation (either by floor, or by group of floors, or all panels on the project as required by the Commissioner) and reinstalled immediately thereafter the observations.

### **3.5 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Retain a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

### **3.6 FIELD QUALITY TESTING**

- A. Perform the following field quality tests and visual inspections, in accordance with NETA Acceptance Testing Specifications.
  - 1. Exterior of the equipment.
  - 2. Interior of the enclosure.
  - 3. Interior bus/cable systems.
  - 4. Bus support insulators and spacing.



5. Doors/panels/brackets.
  6. Door handles/locking bars/mechanisms.
  7. Instruments/relay covers.
  8. Control/metering transformers/instruments.
  9. Grounding/neutral bar installation is correct per application.
  10. Wiring/terminal connections.
  11. Proper electrical clearances are maintained.
  12. Complete circuit directories are properly installed.
  13. Surge protection devices are installed properly.
  14. Load current readings are balanced.
- B. Verify circuit breaker identification, sizing and operation in all distribution panelboards.
1. Compile a comprehensive listing of all distribution panelboards, as well as, their respective directories, feeder sizes and designation from where panels are served from.
  2. Compare equipment nameplate data with the Contract Drawings and specifications.
  3. Inspect circuit breaker for correct mounting.
  4. Inspect case for cracks or other defects.
  5. Test all ground fault devices.
- C. Verify that conductor size is appropriate for breaker size.
1. De-energize each panelboard breaker while observing respective loads served by the breaker.
  2. Re-energize each panelboard breaker verifying equipment is re-energized.
  3. Each tested breaker, when placed in the "OFF" position, breaks electrical power to the respective (labeled) load.
  4. Each tested breaker, when placed in the "ON" position, supplies electrical power to the respective (labeled) load.
  5. No visible and/or audible arcing is present.
  6. There shall be no short circuits.



7. Lugs shall all be torqued per manufacturer's requirements.
8. Panelboards shall be clean and neat. Panelboard covers shall be reinstalled.

**D. Verify Circuit Loads on Distribution Panels.**

1. Ensure all distribution panels have the proper breaker feeding each load.
2. Compile a comprehensive listing of all distribution panelboards, as well as, their respective directories.
3. Verify breaker matches breaker load.
4. Check breaker balance phase-to-phase.
5. Check line to ground resistance.
6. Check setting on the breaker for trip to motor loads.
7. Verify settings and trip on breakers to match the calculated reports.
8. Load shall not be higher than 80% of the breaker.
9. Phases are properly balanced.
10. No more than 0.005 ohm to ground.

- E. Submit all field quality test results. All tests shall be certified by the testing agency.**

**3.7 WARRANTY**

- A. Provide a one (1) year manufacturer warranty from the date of substantial completion.**

**END OF SECTION 26 24 16**



**SECTION 26 27 26  
WIRING DEVICES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide wiring devices in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Switches and Dimmers.
- B. Receptacles.
- C. Wall Plates.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit manufacturer's catalog cuts and specifications for all types for each product indicated. Highlight exact model being proposed in the submittal.
- C. Submit samples for finish, color and texture as requested by the Commissioner.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:



1. Switches.
    - a. NEMA Standards WD-1 and WD-6.
    - b. U.L. 20.
  2. Receptacles:
    - a. NEMA Standards WD-1 and WD-6
    - b. U.L. Standard 498
    - c. U.L. 943 (GFCI receptacles).
    - d. U.L. 514 (Poke Through Assemblies)
- C. Obtain each type of wiring device through a single manufacturer, where available.

## 1.6 WARRANTY

- A. Provide a five (5) year manufacturer's warranty.

## PART 2 - PRODUCTS

### 2.1 SWITCHES

- A. Switches shall be commercial specification grade, flush mounting, quiet-operating AC type, architectural rocker type, heat-resistant plastic housing and self-grounding metal strap. Provide silver alloy contacts. Switches shall be rated 20A at 120-277V and capable of full capacity on all lamp loads. Switches shall be designed for side or back wiring with up to No. 10 AWG wire. Switches shall be rectangular (decorator) style in all areas.
- B. Provide single-pole, double-pole, 3-way, 4-way, pilot or keyed type switches, as indicated on the Contract Drawings or required.
- C. Switch with Pilot Light: Switches indicated with an illuminated rocker switch in the "OFF" position for visual load monitoring shall be provided as indicated on the Contract Drawings.
- D. The color of all devices shall be approved by the Commissioner.
- E. Manufacturers
  1. Switches
    - a. Leviton
    - b. Hubbell



- c. Bryant
- d. Pass & Seymour/Legrand
- e. Lutron
- f. Or approved equal

## **2.2 RECEPTACLES**

- A. Receptacles shall be two-pole, three-wire, grounding, simplex or duplex NEMA 5-20R, rated for 20 amperes at 125 volt electrical alternating current as indicated on the Contract Documents and ANSI standard type, commercial specification grade, with brass contacts that accepts a plug with two (2) parallel blades and one (1) grounding blade. Receptacles shall be equipped with terminals to accept up to No. 10 AWG conductors. Enclosures shall be heat-resistant plastic with nylon face and two (2) grounding screws. Provide break-off terminals for 2-circuit wiring. Provide rectangular decora style.
- B. Ground fault circuit interrupter (GFCI) receptacles shall interrupt ground leakage currents between 4-6 mA having a maximum circuit current of 20 amperes. Employ feed through or non-feed through devices as indicated, or required. Configuration shall be straight blade type NEMA 5-20R. Utilize 2 3/4" deep outlet boxes without any adaptors. Long life LED light shall be provided, within the receptacle. Device shall have a minimum nominal tripping time of 0.025 seconds.
- C. Provide commercial specification grade twist lock type receptacles as indicated on the Contract Documents.
- D. The color of all normal devices shall be approved by the Commissioner.
- E. Manufacturers
  - 1. Receptacles:
    - a. Leviton
    - b. Hubbell
    - c. Thomas & Betts
    - d. Pass & Seymour/Legrand
    - e. Or approved equal

## **2.3 WALL PLATES**

- A. Provide wall plates for all receptacles, outlets, and switches of 430 stainless steel with satin finish, unless otherwise noted. When two (2) or more switches or devices are shown in one (1) location, provide a common wall plate.



- B. Provide cast aluminum metal plate with stainless steel spring loaded, gasketed, double flap lift cover to provide protection for the receptacle and plug when "IN USE" for all exterior receptacles, those in mechanical rooms, those in garages, and where indicated on the Contract Documents. These covers shall be labeled and listed as "extra duty" type.
- C. Manufacturers: By same manufacturer as device utilized.
  - 1. Wall Plates:
    - a. Leviton
    - b. Hubbell
    - c. Thomas & Betts
    - d. Pass & Seymour/Legrand
    - e. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 SWITCHES**

- A. Install all switches vertically with the "ON" position on top, unless noted or specified otherwise.
- B. Where switches are indicated near doors, corner walls, etc., install not less than two (2) inches and not more than twelve (12) inches from the trim.
- C. Carefully coordinate locations of switches to insure locations are at the strike side of doors.
- D. Furnish and install an engraved legend for each switch that controls motors, equipment systems, etc., not located within the sight of the controlling switch.
- E. Install wall dimmers to achieve indicated rating after derating for ganging according to the manufacturer's written instructions.
- F. Install unshared neutral conductors on the line and load sides of the dimmers according to the manufacturers' written instructions.

#### **3.3 RECEPTACLES**

- A. Unless otherwise noted, mount receptacles vertically with U-shaped ground position at the top.



- B. Coordinate device layouts and installation with all other adjacent devices and any wall obstruction prior to any work.

### **3.4 GROUND FAULT CIRCUIT INTERRUPTERS (G.F.C.I.)**

- A. Swab all conduits and outlet boxes clear of moisture.
- B. Do not combine G.F.C.I. protected circuits with other circuits in the same raceway; only one (1) G.F.C.I. circuit per raceway.
- C. Do not substitute G.F.C.I. circuit breakers for G.F.C.I. receptacles.
- D. All G.F.C.I. receptacles shall be installed in a readily accessible location per the NEC.

### **3.5 DEVICE GROUNDING**

- A. Provide a No. 12 AWG grounding conductor from the device grounding terminal to the panelboard ground bus.
- B. Provide a No. 12 AWG grounding conductor from the device grounding terminal to the outlet box.

### **3.6 INSTALLATION**

- A. All devices shall be flush-mounted except as otherwise noted on the Contract Documents.
- B. Locations
  - 1. Comply with layout drawings for general location.
  - 2. Relocate outlets obviously placed in a location or manner not suitable to the room finish.
  - 3. Avoid placing outlets behind open doors.
- C. Mounting heights and positions are specified as indicated on the Contract Documents. Architectural drawings take precedence over heights and positions specified in the electrical specifications.
- D. Ganging of Switches: Provide steel barriers between ganged switches of different phases between all ganged dimmers; and between normal and emergency sources.
- E. Fastening: Securely fasten the devices into the outlet boxes and attach appropriate wall plates.
- F. Testing
  - 1. After installing wiring devices and after circuiting has been energized, test for proper polarity, ground continuity, and other requirements indicated on the Contract Documents.
  - 2. Test GFCI operation with local fault simulation per the manufacturer's instructions.



3. Replace all malfunctioning devices with new and retest as specified above.

G. All devices shall be provided with identification as indicated in the identification specification section.

### **3.7 CLEANING**

A. Clean equipment and devices internally and externally using methods and materials recommended by the manufacturer, and repair any damaged finishes.

### **3.8 SERVICE AND SUPPORT**

A. Startup and Programming

1. Provide a factory-certified field service engineer to visit the site to ensure proper system installation and operation under the following parameters:

a. Qualifications for factory-certified field service engineer:

- 1) Minimum experience of two (2) years in the electrical/electronic field.
- 2) Certified by the equipment manufacturers on the systems installed.

b. Perform site visits upon completion of the wiring device systems, installation, and;

- 1) Verify connections and locations of all control devices.
- 2) Verify systems operation control, zone by zone.
- 3) Verify proper integration of the manufacturers' interfacing equipment.
- 4) Obtain sign-off on all system functions.

**END OF SECTION 26 27 26**



**SECTION 26 28 13  
FUSES (600 V AND LESS)**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide 600 Volt and less fuses in accordance with the Contract Documents.

**1.3 RELATED DOCUMENTS**

- A. Refer to DDC General Conditions for additional requirements applying to this Section.

**1.4 WORK INCLUDED**

- A. Fuses and Accessories.
- B. Spare Fuse Cabinets.

**1.5 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
  - 1. Submit dimensioned drawings of each spare fuse cabinet by type and size. Indicate storage provisions for fuse cartons.
- C. Product Data
  - 1. Provide a complete set of let-through curves for each type of fuse.



2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
3. Submit listing of all types, sizes and quantity of fuses which will be installed including location of each.
4. Submit listing of all spare fuses by types, sizes and quantities, which will be furnished for placement in the respective fuse cabinets.
5. Upon completion of a coordination study, provide and coordinate appropriate fuse components, as required by the study.
6. Provide appropriate fuse curves and let-through values for the selected manufacturer.

## **1.6 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  1. U.L. Standard #198.
  2. U.L. Standard #977.
  3. NFPA 70, Article 100.
  4. ANSI.
  5. IEEE 242.
- C. All fuses shall be the same type within a piece of equipment.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Mains, Feeders and Branch Circuits
  1. Circuits 601 to 6000 amperes shall be protected by Class L, Low Peak Yellow Time-Delay fuses, type KRP-C (amp) SP with 200,000 RMS symmetrical interrupting current rating.
  2. Circuits 0 to 600 amperes shall be protected by Class RKI, Low Peak Yellow dual element fuses, type LPN-RK (amp) SPI for 250 volt applications and LPS RK (amp) SPI for 600 volt applications, with 200,000 RMS symmetrical interrupting current rating. Provide open fuse indicator.



3. A minimum 2:1 ratio must be allowable between the ampere rating of the main fuse and that of the feeder fuse, and between the feeder fuse and branch circuit fuse to obtain selective coordination and minimize switch size.
4. Metal end caps of fuses rated 61 through 600 amperes shall be electrically connected to the fuse blades to facilitate voltage testing during OSHA required lock out/tag out procedures.
5. All fuses shall be of the same manufacturer.

**B. Motor Protection**

1. All the individual motor circuits shall be protected by class RK1, Class J, or Class L time delay type fuses. Motors under 10 HP may utilize Class CC fuses with blown indicators.
2. Fuse sizes for motor protection shall be appropriate for starting current of the motor.

**C. Spare Fuse Cabinets**

1. Spare fuse cabinets shall be provided. The cabinet shall be constructed of minimum .080 heavy duty aluminum, with baked ASA61 gray enamel paint. The wall mounted cabinet door shall be equipped with a locking handle and cylinder lock. Mounting holes with key slots 16 inches on center shall be provided.
2. Spare fuse cabinets shall be provided as a minimum in the following locations:
  - a. Each main normal and emergency electrical room.
  - b. Each major mechanical equipment room.

**D. Labels**

1. "Low-Peak Yellow" or equivalent notice labels to alert the end user of the engineered level of protection of the electrical equipment shall be field installed by the Electrical Subcontractor. They shall be obtained from the fuse manufacturer, marked with the proper fuse rating per the specifications and placed in a visible location in the enclosure.
2. Label each spare fuse cabinet.

**2.2 MANUFACTURERS**

**A. Fuses**

1. Cooper Bussmann
2. Mersen
3. Littelfuse



4. Or approved equal
- B. Spare Fuse Cabinet
  1. Cooper Bussmann
  2. Mersen
  3. Littelfuse
  4. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 GENERAL**

- A. Do not install fuses until equipment is ready to be energized. Final tests and inspections shall be made prior to energizing the equipment.
- B. Provide all fuses except as otherwise noted. All fuses shall be new.
- C. Replace any fuses which are not functioning.
- D. Labels: Install appropriate label supplied the by fuse manufacturer within each switch, motor starter, or panelboard door, or at location next to the fuse clips.
- E. Coordinate fuse ratings with HVAC, refrigeration, and plumbing equipment limitations for maximum fuse size prior to any installation.
- F. Arrange fuses so rating information is readable without removing fuses.
- G. As-built drawings shall indicate actual fuse sizes, ratings and types.
- H. Install spare fuse cabinets.

**END OF SECTION 26 28 13**



**SECTION 26 28 16  
DISCONNECT SWITCHES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide disconnect switches in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Safety Switches (Fused and Non-Fused Types).  
B. Manual Control Switches.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.  
B. Product Data
1. Submit manufacturers' data for all disconnect switches, including dimensional data, ratings, fuse ratings and types, and cable terminal sizes.
  2. Identify motor or equipment served by each switch; indicate nameplate inscription.



## 1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest applicable recommendations of the following:
  - 1. U.L. Standards #98.
  - 2. NEMA Standard KS1.
  - 3. U.L. 20 Test Standards for Toggle Switches.
  - 4. NFPA 70.

## PART 2 - PRODUCTS

### 2.1 SAFETY SWITCHES

- A. Provide heavy-duty, horsepower rated, single-throw knife switch with quick-make/quick-break mechanism, capable of full load operations. Switches shall meet NEMA specifications for Class A switches.
- B. Provide with contact arc-quenching devices, such as magnetic blowouts or snuffing plates. Provide self-aligning switchblades with silver alloy contact areas, designed so that arcing upon making and breaking does not occur on final contact surfaces. Provide with high-pressure, spring-loaded contact. Switch parts shall be mounted on high-grade insulating base.
- C. Enclosure: Shall be NEMA 1 with hinged door, and defeatable interlock when switch is in "ON" position, able to be padlocked in "ON" and "OFF" positions. Provide NEMA 3R (rain-tight) enclosure for exterior installations and NEMA 12 in warehouse and mechanical rooms.
- D. Size, fusing and number of poles shall be provided as shown on the Contract Documents or as required. Where fused, the switch shall be provided with U.L. listed rejection feature to reject all but Class R fuses. Provide horsepower rated switch to match motor load if size is not shown. Provide 3 pole plus solid neutral switches on four wire circuits and 3 pole switches on all other circuits, unless otherwise noted.
- E. Lugs shall be U.L. listed for copper conductors and be front removable. Coordinate lug sizes and quantities with the respective line and load feeder and provide accordingly.
- F. Provide six (6) pole switches for connection to motors with the following starter types:
  - 1. Non-reversing - two step - part winding - star connected.
  - 2. Non-reversing - full voltage - two speed separate winding.
  - 3. Non-reversing - full voltage - two speed single winding.



- 4. Where otherwise required.
- G. Provide auxiliary contacts for switches where required or where indicated on the Contract Documents.
- H. Viewing Windows – Provide viewing windows for all safety switches to provide blade visibility when the switch door is closed.

## **2.2 TOGGLE TYPE MANUAL CONTROL SWITCHES**

- A. Provide switches which operate at their full rating with fluorescent, tungsten, and resistance loads and at 80% of their rated capacity with motor loads.
- B. Switches shall be heavy duty type and shall have:
  - 1. Arc-resisting bodies.
  - 2. Slow make-and-break mechanisms.
  - 3. Silver alloy contact buttons.
  - 4. Side or back wiring with up to No. 10 AWG solid conductors.

## **2.3 MANUFACTURERS**

- A. Safety Switches
  - 1. Square 'D'
  - 2. Eaton
  - 3. General Electric
  - 4. Siemens
  - 5. Or approved equal
- B. Toggle Type Manual Control Switches
  - 1. Square 'D'
  - 2. Eaton
  - 3. General Electric
  - 4. Siemens
  - 5. Or approved equal



### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 APPLICATIONS**

- A. Provide each motor over ½ HP with a horsepower rated safety-type disconnect switch.
- B. Provide each piece of equipment utilizing multi-phase power with a safety-type disconnect switch.
- C. Provide each piece of equipment utilizing single-phase power but protected at over 30 amperes with a safety-type disconnect switch.
- D. Equipment other than that mentioned above shall utilize toggle type manual control switch properly sized and rated for equipment it disconnects.
- E. Factory installed disconnect switches may be used to satisfy the above requirements.
- F. Disconnect switches serving the fire alarm system shall be painted RED.

#### **3.3 MOUNTING**

- A. Provide connections and wiring to and from each disconnect switch.
- B. Provide all frame supports, backboards and the like for proper mounting of all starting, control and disconnect equipment installed under this Division. Angle iron frames, racks and backboards shall be of adequate dimensions to permit an orderly arrangement of equipment and conduit connections therein.
- C. Disconnect switches shall be mounted on adjacent wall or from the floor with independent supports. Switches shall not be mounted on the equipment housings.
- D. Switch enclosure shall be rigidly mounted and with proper alignment on building structure or steel supports with centerline of operating handle not more than 6 feet above finished floor unless otherwise required. Steel supports fabricated from standard rolled structural steel shapes or framing channel shall be used to provide one-inch separation between enclosure and building wall for vertical flow of air.
- E. Fuses shall be installed as specified in this Division.
- F. Completed installation shall contain no extraneous openings.
- G. All viewing windows shall be cleaned.
- H. Ground and bond all circuit and motor disconnect switches.
- I. Tighten connector and terminal bolts in accordance with the manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A.



### **3.4 IDENTIFICATION**

- A. Provide nameplate identification of all disconnect switches in accordance with these specifications. Nameplate shall include fuse type and rating.

### **3.5 FIELD TESTING**

- A. The following field acceptance tests shall be performed and test report submitted:
1. Compile a comprehensive listing of building motor loads, including voltage, phase, HP, FLA, and location.
  2. Compare equipment nameplate data with the Contract Drawings and specifications.
  3. Command inductive motor loads to start through respective manual or computer controls.
  4. With individual motor loads running break power to the load with respective disconnect switch and/or safety stop.
  5. Wait until motor loads come to a complete stop.
  6. Re-connect power to the motor load with the respective disconnect switch and/or safety stop.
  7. Compare fuse size with motor full-load current rating to verify correct sizing.
  8. Verify that no visible or audible arcing is present.

**END OF SECTION 26 28 16**



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**SECTION 26 29 13  
INSTALLATION OF INDIVIDUAL MOTOR CONTROLLERS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Install individual motor controllers specified by other Divisions in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Installation of Individual Motor Controllers, including variable frequency drives.

**1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit a motor matrix spreadsheet for each floor of the building. The spreadsheet shall be completed with accurate data for each of the following columns:
  - 1. Equipment Designation.
  - 2. Quantity.
  - 3. Location.
  - 4. HP/kW.
  - 5. Voltage.
  - 6. Phase.



7. FLA.
8. Conduit.
9. Phase Conductors (Quantity and Size).
10. Ground Conductors (Quantity and Size).
11. Starter Size (NEMA)
12. Starter Heater Size.
13. Starter Fuse Size.
14. Disconnect Switch Size.
15. Disconnect Switch Fuse Size.
16. Loose Starter/VFD
17. Combination Starter/Disconnect Switch.
18. Starter in Motor Control Center.
19. Integral Control Panel.
20. Motor Rotation.
21. Panel Serving the load.
22. Circuit Breaker or Fuse/Switch serving the load.

C. This submittal shall be coordinated with the Mechanical and BMCS subcontractors prior to submission for approval.

D. The matrix shall include all HVAC, plumbing and fire protection equipment.

## **1.5 QUALITY ASSURANCE**

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

## **PART 2 - PRODUCTS**

### **2.1 NOT USED.**



### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 INSTALLATION OF MOTOR CONTROLLERS**

- A. Install individual motor controller on nearby wall, within ten feet of motor to be controlled or adjacent to motor on steel supports fabricated from standard rolled structural steel shapes or framing channel, or as required by the Contract Documents. Do not mount controllers on the equipment or fan housings.
- B. Perform all necessary field modifications and mounting adjustments to each individual motor controller to provide required operation.
- C. Coordinate installation with remote control devices and remote indicating devices for a complete and functional operation.
- D. Overload Elements: Furnish and install properly rated elements in controllers in accordance with the manufacturer's requirements.
- E. Furnish and install incoming and outgoing power feeders, including ground conductor.
- F. Nameplates: Furnish and install equipment identification nameplates on the exterior doors with rivets, brass or cadmium plate screws. The use of vinyl type adhesives or the like is unacceptable.
- G. Completed installation shall contain no extraneous openings.

#### **3.3 FUSED DISCONNECT SWITCH**

- A. Provide fused disconnect switches as noted on the Contract Documents and where multiple motor controllers are served by a common branch circuit or feeder.

#### **3.4 COORDINATION**

- A. Review HVAC, Plumbing, and Fire Protection Contract Documents for required starter accessories, interlocks, etc.
- B. Exact locations for all controllers and disconnect switches shall be coordinated with the mechanical subcontractor and Commissioner prior to any work. Locate coordinated controllers and disconnect switches locations on all coordination drawings.

#### **3.5 FIELD VERIFICATIONS**

- A. Verify proper operation of all motor starters for each individual motor load including:
  - 1. Compile a comprehensive listing of building motor loads.



2. Compare equipment nameplate data with the Contract Documents and specifications.
3. Inspect physical and mechanical condition.
4. Motor-Running Protection
  - a. Compare overload element rating with motor full-load current rating to verify correct sizing. Replace if not proper size.
  - b. If motor-running protection is provided by fuses, verify correct rating considering motor characteristics and power-factor correction capacitors, if applicable.
  - c. When motor starter is in the "AUTO" position, command motor starter load to "RUN" from automatic control point.
  - d. With motor starters in the "AUTO" position, command motor starter load to "STOP" from automatic control point.
  - e. Switch the motor starter into the "HAND" position.
  - f. Return motor starter "HAND/AUTO" switch to original position.
  - g. Run/stop lights shall operate and correspond to load conditions.

**B. Verify Voltage, Amperage and Phasing for Motors.**

1. Compile a comprehensive listing of all building motor loads.
2. Compare equipment nameplate data with the Contract Documents.
3. Inspect physical and mechanical condition.
4. Inspect for correct anchorage, mounting, grounding, connection and lubrication.
5. Command motor load or major electrical equipment to run under the expected full load condition.
6. Verify the absence of unusual mechanical or electrical noise or signs of overheating during initial test run.
7. Measure the voltage and insulation resistance of each phase to ground and phase to phase.
8. Measure running amperes and evaluate relative to load conditions and nameplate full-load amperes.
9. Verify rotation to insure correct shaft direction.
10. Test the motor overload relay elements by injecting primary current through the overload circuit and monitoring trip time of the overload relay.



11. Test operation of the overcurrent protective device.
- C. Verify Motor Winding Resistance.
1. Compile a comprehensive listing of all building motor loads.
  2. Compare equipment nameplate data with the Contract Documents.
  3. Measure the voltage to each motor.
  4. Measure the start load and amps.
- D. Verify Magnetic Starter Heaters
1. Compile a comprehensive listing of all building motor loads.
  2. Compare equipment nameplate data with the Contract Documents.
  3. Check magnetic starter heater size installed.
  4. Check starters on-auto-off.
- E. Submit all field test results.

**END OF SECTION 26 29 13**



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**SECTION 26 29 19  
SWITCHBOARDS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
  - 1. The Contract Drawings.
  - 2. The Specifications.
  - 3. The General Conditions.
  - 4. The Addendum.
  - 5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide service distribution switchboards rated 600V or less in accordance with the Contract Documents.

**1.3 WORK INCLUDED**

- A. Switchboards.
- B. Service Switches
- C. Disconnecting and Overcurrent Protective Devices
- D. Surge Protection Devices (SPD)
- E. Utility Metering and C.T. Equipment
- F. Mimic Bus
- G. Short Circuit Analysis and Arc Flash Study
- H. Instrumentation and Control Power



#### **1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Shop Drawings
  - 1. Include fully detailed and dimensioned plans, sections and elevations of each section of the switchboards. Include information on type and size of structural supports, metal thicknesses, surface finishes, bus cross sections, and provisions for lifting. Drawings shall be a minimum of 1/4" scale.
  - 2. All concrete housekeeping pads must be sized and illustrated.
  - 3. Detail utility company's metering and C.T. cabinet provisions with indication of approval by the utility company.
  - 4. Include all required 2011 NYC Electrical Code maintenance clearance space around each piece of equipment.
  - 5. Detail descriptive documentation of any barriers specified for electrical insulation and/or isolation.
  - 6. Conduit entrance locations and requirements must be identified.
  - 7. Indicate shipping splits coordinated with the project delivery path to assure all equipment can be moved into place.
  - 8. Include documentation of NYC Advisory Board Approval.
- C. Product Data
  - 1. Single line diagram of switch, fuse, circuit breakers, bus arrangements, ground fault protection, surge protective devices, fuse cut outs, metering arrangements, etc.
  - 2. Furnish complete schematic wiring diagrams and a full set of equipment wiring diagrams for protective equipment relays, over current protection devices, pilot lights, alarms, controls, etc. Provide narratives for all wiring diagrams submitted.
  - 3. Include full load heat rejection in BTU per hour for total components by switchboard.
  - 4. All fuse and circuit breaker sizes and types must be indicated.
  - 5. All nameplate information must be complete.
  - 6. All mimic bus arrangements must be illustrated.
  - 7. Short circuit and coordination study must be provided at the time of the switchboard submission. The switchboard submission must be coordinated with the study results.



8. All diagrams shall include system voltage, phase, frequency, bus current ratings and withstanding ratings.
9. Detail features, characteristics, ratings, and factory settings of the individual overcurrent protection devices and auxiliary components.
10. Detail enclosure types for each type other than NEMA 250, Type 1.
11. Include time-current coordination curves for each type and rating of overcurrent protective device included in the switchboards. Submit on translucent log-log graft paper, include selectable ranges for each type of overcurrent protective device.
12. Submit testing procedures which will be used for field quality testing.

**D. Test Reports**

1. Submit test data verification of fault current withstand rating.
2. Submit certified reports of field quality testing.

**1.5 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
  1. Ground Fault Circuit Protection UL 1053.
  2. QMQB Operators UL E1818.
  3. Bolted Pressure Switches UL 977.
  4. Switchboards NEMA Standards PB-2, PB-2.1, PB-2.2; UL 891 and UL Service Entrance Label.
  5. Meters ANSI Specification C 39.1.
  6. ANSI C37.13.
  7. ANSI C37.51.
  8. NETA
  9. Molded Case Circuit Breakers UL 489 and NEMA AB1.
  10. NRTL labeled for service equipment.



- C. Each switchboard as a complete and finished product shall receive a single integrated equipment rating by the manufacturer. The integrated equipment short-circuit rating shall certify that all equipment is capable of withstanding the thermal and magnetic stress of a fault equal to the value calculated by the Contractor/manufacturer's coordination study. Such rating shall be established by actual tests by the manufacturer on similar equipment. This certification shall be permanently affixed to each switchboard. Test data shall be submitted to the Commissioner at the time of submission of Submittal Drawings.
- D. Only qualified staff shall be allowed to work on the installation of this equipment and all terminations, as defined in NEMA PB2.1 and NFPA 70E.
- E. Obtain all switchboards, overcurrent protection devices, components, and accessories from a single manufacturer.

#### **1.6 SHORT CIRCUIT AND COORDINATION STUDY**

- A. Refer to the Overcurrent Protective Device Coordination Study specification section for all requirements.

#### **1.7 ARC-FLASH HAZARD ANALYSIS**

- A. Refer to the Overcurrent Protective Device Coordination Study specification section for all requirements.

### **PART 2 - PRODUCTS**

#### **2.1 GENERAL**

- A. Provide switchboards of the free standing, totally enclosed dead-front safety type, consisting of an assembly of bolted pressure switches; self-contained switch units; and thermal magnetic molded-case chassis mounted feeder circuit breakers of the number, size and arrangement shown on the Contract Documents.
- B. Provide front accessible equipment where all connections are accessible from the front.
- C. Overcurrent devices shall be provided as individually mounted devices in switchboards of 1,200 amperes or more. Provide group mounted in switchboards rated below 1,200 amperes.
- D. Carefully check the physical space limitations for each switchboard and furnish switchboards to match those conditions. Nothing in these specifications shall preclude the use of a custom designed switchboard (as reviewed by the Commissioner) to meet those limitations.
- E. Switchboard enclosures shall be steel, NEMA 250, Type 1 and fully gasketed, except where indicated otherwise on the Contract Documents.
- F. Provide service entrance label where required.
- G. Provide dedicated switchboard cubicles for switches or circuit breaker taps serving fire pump(s). These cubicles shall be provided with steel barriers and painted red. The fire pump take-off shall be tapped ahead of the main service switch and after the main utility meter. Fire pump switches or breakers shall be in stand-alone sections, independent of the switchboard tap and any other overcurrent device or metering.



- H. Provide High Pressure Contact (HPC) type switches when feeding step-up or stepdown transformers. Switches must have a closing rating of twelve times (12x) the continuous current rating compared to a standard bolted pressure switch which has six times (6x) the closing rating.
- I. All switchboards and service switches shall be rated for 200,000 AIC bracing, U.O.N.

## **2.2 CONSTRUCTION**

- A. The enclosure shall be formed structural steel, forming a rigid structure. Turned down peripheral edge on front and rear panels.
- B. Completely enclosed on the back, front, and sides with removable panels. All closure plates shall be small enough for easy handling by the operator.
- C. All sections shall be the same height, 90 inches, except as otherwise required due to physical space limitations. All sections shall be the same depth.
- D. The switchboard enclosure shall be painted on all exterior surfaces. The paint finish shall be a medium gray, ANSI 49, applied by the electro-deposition process over an iron phosphate pre-treatment.
- E. Provide steel barriers between each section of the switchboard.
- F. Compartments indicated as "SPACE" or "FUTURE" shall be equipped with mounting brackets, supports, bus connections, and appurtenances at full rating of the overcurrent device compartment.

## **2.3 PULLBOX OVER SWITCHBOARD**

- A. Where required for conduit terminations, provide a pullbox of the same type of construction and finish as the switchboard. Adequate ventilation to maintain temperature in the pullbox within the same limits as the switchboard.
- B. Provide cable supports for horizontal support of cables. Construct supports of ¾-inch conduit loosely enclosed by strong fiber tubes. Space supports no more than 24 inches horizontally and 6 inches vertically.
- C. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into the switchboard.
- D. Removable covers shall form top, front and sides. Top covers at rear shall be easily removable.

## **2.4 BUSES**

- A. Bus bars shall be arranged throughout A-B-C left to right, top to bottom, and front to rear.
- B. Conductor material shall be copper of 98% conductivity silver plated.
- C. Bus shall be sized at 1,000 amperes per square inch, but, in no case, less than of sufficient cross section to limit temperature rise to 55°C above an ambient temperature of 40°C.



- D. Horizontal bus shall be full-size, tapered bus is not permitted. Provide bolt holes drilled and tapped for future extension at the end of the bus bars including the neutral and ground buses. The provisions shall include bus bars installed and extended to the extreme side of the section and shall be fabricated in such a fashion that the addition of a future section would require only the installation of standard bolted splice plates.
- E. All bus bars shall be rigidly braced to comply with the integrated equipment rating of the switchboard.
- F. Neutral bus shall be rated 100 percent of the ampacity of the phase buses.
- G. Bus bars shall be extended vertically to the fullest extent to allow the installation of future devices, space permitting.

## **2.5 FEEDER INSTALLATION AND TERMINATION**

- A. Bolted and accessible from the front for front access type.

## **2.6 BOLTED PRESSURE SWITCHES**

- A. Switches 800 amperes and above and all main switches and service switches shall be bolted pressure type.
- B. Manually operated and, where indicated, electrically tripped. Dead front, totally enclosed in a cabinet designed as a complete magnetic circuit. Interlock to prevent access to a closed switch. Interlock capable of intentional bypass by knowledgeable personnel.
- C. Fuse compartment shall be interlocked to prevent access when a switch is in the "CLOSED" position.
- D. Maximum temperature rise at full load - 30°C spot temperature.
- E. Short-Circuit Rating: 200,000 amperes Root Mean Square symmetrical.
- F. Capable of being opened when carrying 750 percent of its rated load. Opening under these conditions requires no major physical effort.
- G. Arc barriers and replaceable arcing contacts shall be provided.
- H. Switch shall be of the charge before closing type.
- I. U.L. listed for continuous operation.
- J. Handle shall be capable of being padlocked in the "OFF" position.
- K. Ground Fault Relay: Comply with UL 1053; self-powered type with mechanical ground-fault indicator, test function, tripping relay with internal memory, and three-phase current transformer/sensor.
  - 1. Configuration: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.



2. Internal Memory: Integrates the cumulative value of intermittent arcing ground-fault currents and uses the effect to initiate tripping.
3. No-Trip Relay Test: Permits ground-fault simulation test without tripping switch.
4. Test Control: Simulates ground fault to test relay and switch (or relay only if "NO TRIP" mode is selected).

## **2.7 SELF-CONTAINED SWITCH UNITS**

- A. Switches 600 amperes and below shall be self-contained type, in accordance with NEMA KS1.
- B. Switches shall be quick-make, quick-break, dead-front type. Each switch shall be a self-contained unit, externally operated from the front.
- C. Fuse and switch compartment shall be interlocked to prevent access to the fuse compartment until the switch is thrown to the "OFF" position. Interlock shall be intentionally releasable by an externally applied tool to permit checking of the switch and fuses under load.
- D. Switches shall be equipped with rejection type clips suitable for Class R fuses.
- E. Handle shall be capable of being padlocked in the "OFF" position.

## **2.8 FEEDER CIRCUIT BREAKERS**

- A. Circuit breaker(s) shall be group mounted bolt-on type with mechanical restraint on a common pan or rail assembly.
- B. The interior shall have three (3) flat bus bars stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. The molded polyester insulators shall support and provide phase isolation to the entire length of bus.
- C. Circuit breaker(s) equipped with line terminal jaws shall not require additional external mounting hardware. Circuit breaker(s) shall be held in a mounted position by a self-contained bracket secured to the mounting pan by fasteners. Circuit breaker(s) of different frame sizes shall be capable of being mounted across from each other.
- D. Line-side circuit breaker connections shall be jaw type.
- E. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.
- F. Thermal magnetic molded case circuit breakers shall:
  1. Molded case circuit breakers shall have integral and instantaneous thermal magnetic trip in each pole. Provide adjustable trip setting for circuit breaker frame sizes 250A and larger; adjustable instantaneous trip circuit branches; or magnetic trip element with front-mounted field adjustable trip setting.



2. Circuit breaker(s) shall be standard interrupting. Ampere ratings shall be as shown on the Contract Documents. Manufacturer shall submit one (1) set of published  $I_p$  and  $I_{2t}$  let-through curves (as required by UL) to the Commissioner.
- G. Electronic trip circuit breakers with RMS sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
1. Instantaneous trip.
  2. Long and short-time pickup levels.
  3. Long and short-time time adjustments.
  4. Ground-fault pickup level, time delay, and  $I_{2t}$  response.
- H. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
- I. Molded-Case Circuit Breaker (MCCB) Features and Accessories:
1. Standard frame sizes, trip ratings, and number of poles.
  2. Lugs: Suitable for number, size, trip ratings, and conductor material.
  3. Ground-Fault Circuit Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
  4. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
  5. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system specified.
  6. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
  7. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
  8. Auxiliary Contacts: Two (2) SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
  9. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in "OFF" position.

## 2.9 GROUNDING

- A. Provide ground bus of at least 33 percent of capacity of the switchboard extending along the full length of the switchboard.



## **2.10 GROUND FAULT PROTECTION**

- A. Ground fault protection (GFP) shall be provided where indicated on the Contract Documents and on all disconnect switches rated 1000 amperes or more as required by the 2011 NYC Electrical Code.
- B. The ground fault protection shall consist of the following:
  - 1. **Current Sensors:** Provide zero sequence current sensors for feeder and branch devices and ground return sensors for main service device; inputs compatible to relay. Construct sensor frame so it can be opened to permit removal or installation around conductors without disturbing conductors. Provide test winding in sensor for testing operation of GFP unit, including sensor pick-up, relay, and circuit protection device operation.
  - 2. **Ground-Fault Relay:** Provide solid-state ground-fault relay, which requires no external source of electrical power, drawing energy to operate GFP system directly from output of current sensor. Construct with adjustable pick-up current sensitivity for GF currents from 200 to 1200 amperes, with calibrated dial to show pick-up point settings. Provide factory-set time delay of 0.5 seconds and which precludes tampering with setting after installation.
  - 3. **Monitor Panel:** Provide monitor panel capable of indicating relay operation, and provide means for testing system with or without interruption of service. Construct so GFP system cannot be left in an inactive or "OFF" state. Provide indicator lamps and TEST and RETEST control switches. The panel shall be installed in the front of the switchboard adjacent to the device being protected.
  - 4. **Shunt-Trip:** Each device, switch, or circuit breaker, with ground fault protection, shall be provided with a shunt-trip mechanism which shall automatically "OPEN" the device when signaled by the ground-fault sensor.
- C. Provide a fuse protected central power transformer from the switchboard line side for the ground fault systems. Ground fault and shunt-trip device shall be capable of operation at 55% of the rated voltage.
  - 1. **Settings**
    - a. The electrical trade shall set each ground fault sensor pick up setting at 25% of the rating of the over-current device with a 6-cycle time delay unless specifically indicated otherwise in the short circuit and coordination study.

## **2.11 UTILITY METERING**

- A. **Utility Metering Compartment:** Fabricated, barrier compartment and section complying with the utility company's requirements; hinged sealed door, buses provisioned for mounting the utility company's current transformers and potential transformers or potential taps as required by the utility company. If a separate vertical section is required for utility metering, match and align with the entire switchboard. Provide service entrance label and necessary applicable service entrance features.
- B. Utility meters shall not be mounted in or on the switchboard.



## 2.12 METERING

- A. Instrument Transformers: IEEE C57.13, NEMA EI 21.1, and the following:
1. Potential Transformers: IEEE C57.13; 120 V, 60 Hz, secondary; disconnecting type with integral fuse mountings. Burden and accuracy shall be consistent with connected metering and relay devices.
  2. Current Transformers: IEEE C57.13; 5 A, 60 Hz, secondary winding and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
  3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
  4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.
- B. Multifunction Digital-Metering Monitor: Provide at each new switchboard. Microprocessor-based unit suitable for four-wire systems and with the following features:
1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
    - a. Phase Currents, Each Phase: Plus or minus 1 percent.
    - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
    - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
    - d. Kilowatts: Plus or minus 2 percent.
    - e. Kilovars: Plus or minus 2 percent.
    - f. Power Factor: Plus or minus 2 percent.
    - g. Frequency: Plus or minus 0.5 percent.
    - h. Accumulated Energy, Kilowatt Hours: Plus or minus 2 percent; accumulated values unaffected by power outages up to 72 hours.
    - i. Kilowatt Demand: Plus or minus 2 percent; demand interval programmable from 5 to 60 minutes.
    - j. Contact devices to operate remote impulse-totalizing demand meter.
  2. Mounting: Display and control unit flush mounted in the instrument compartment door.
- C. Ammeters, Voltmeters, and Power-Factor Meters: ANSI C39.1.



1. Meters: 4-inch diameter or 6 inches square, flush or semiflush, with antiparallax 250 degree scales and external zero adjustment.
  2. Voltmeters: Cover an expanded-scale range of nominal voltage plus 10 percent.
- D. Instrument Switches: Rotary type with "OFF" position.
1. Voltmeter Switches: Permit reading of all phase-to-phase voltages and, where a neutral is indicated, phase-to-neutral voltages.
  2. Ammeter Switches: Permit reading of current in each phase and maintain current-transformer secondaries in a closed-circuit condition at all times.
- E. Feeder Ammeters: 2-1/2-inch minimum size with 90 or 120 degree scale. Meter and transfer device with "OFF" position, located on overcurrent device door for indicated feeder circuits only.
- F. Watt Hour Meters and Wattmeters:
1. Comply with ANSI C12.1.
  2. Three-phase induction type with two stators, each with current and potential coil, rated 5 A, 120 V, 60 Hz.
  3. Suitable for connection to three and four wire circuits.
  4. Potential indicating lamps.
  5. Adjustments for light and full load, phase balance, and power factor.
  6. Four-dial clock register.
  7. Integral demand indicator.
  8. Contact devices to operate remote impulse-totalizing demand meter.
  9. Ratchets to prevent reverse rotation.
  10. Removable meter with drawout test plug.
  11. Semiflush mounted case with matching cover.
  12. Appropriate multiplier tag.
- G. Impulse Totalizing Demand Meter:
1. Comply with ANSI C12.1.
  2. Suitable for use with switchboard watt-hour meter, including two-circuit totalizing relay.



3. Cyclometer.
4. Four-dial, totalizing kilowatt-hour register.
5. Positive chart drive mechanism.
6. Capillary pen holding a minimum of one month's ink supply.
7. Roll chart with minimum 31-day capacity; appropriate multiplier tag.
8. Capable of indicating and recording 30-minute integrated demand of totalized system.

### **2.13 MIMIC BUS**

- A. Provide a factory installed mimic bus on the switchboard, accurately depicting phase bus work, take-offs, connections, meters and disconnecting means per the factory record as-built drawings.
- B. Mimic bus shall be ¼ inch thick, heat and impact resistant, beveled bakelite, ½ inch wide, secured to the switchboard enclosure with cadmium plated screws.
- C. Mimic bus on the normal switchboards shall be ivory colored and red colored on the emergency switchboards.
- D. Mimic bus shall be installed prior to energizing the equipment.

### **2.14 EMERGENCY SWITCHES**

- A. Devices or enclosures serving the normal side of fire alarm systems or fire pumps shall have the cover of that device enclosure painted high gloss red and suitably labeled.

### **2.15 MANUFACTURERS**

- A. Switchboards
  1. Electrotech
  2. All City Switchboard
  3. Lincoln Electric
  4. General Electric
  5. Square D
  6. Siemens.
  7. Eaton/Cutler Hammer
  8. Or approved equal



- B. Bolted Pressure Switches and High Pressure Contact Switches
  - 1. Pringel Switch Company
  - 2. General Electric
  - 3. Siemens
  - 4. Or approved equal

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.
- 3.2 Install switchboards when the area is free and clear of dust and debris. Protect switchboards continuously from dust and moisture. Do not utilize switchboards for temporary lighting and power services except where authorized in writing by the City of New York.
- 3.3 Install switchboards on 4-inch-high concrete housekeeping pads which shall follow the contour of the switchboards with 4 inch clear all around, per the factory record drawing.
- 3.4 Provide steel channel sills below each switchboard where the switchboard frame is not suitable for use as a floor sill.

#### **3.5 FEEDER INSTALLATION AND TERMINATION**

- A. Group cables paralleling one another and arranged so as to permit easy insertion of a clamp-on ammeter on each cable.
- B. All line and load side conductors emanating from the top or bottom of the switchboards shall be lashed to cable braces provided in the switchboard. Lashing shall be performed as per the manufacturer's recommendations to maintain the integrated equipment rating. Lashing material shall be nonmetallic fire and heat resistant with a tensile strength of 2,000 pounds. In general on service entrance cable, run and bend the cable in a manner so as to rest directly against the cable braces. Make six (6) revolutions around the "A" and "B" phase and the six (6) revolutions around the "B" and "C" phase cables. With the remaining lashing material make four (4) to five (5) revolutions between each of the phase cables tying a knot to the cable braces as the last revolution is complete. All revolutions must be as tight as possible to prevent magnetic stress during short circuits. Load cables in general should be lashed with four (4) revolutions around the cable and the brace, then tied in a knot after the last revolution.
- C. At the completion of the work, each switchboard shall be field tested by a manufacturer's representative as described below. A report recording each item of the testing shall be certified by the manufacturer and submitted to the Commissioner.
  - 1. Operation of each disconnecting means under load.



2. Operation of all metering equipment.
3. Operation of all alarm devices.
4. Observation of cable bracing, both incoming and outgoing, certifying that it is in accordance with the manufacturer's recommendations.
5. Verification of setting of all ground fault protection (GFP) systems. Test each system by checking coordination between ground fault and phase to ground fault of a single pole lighting branch circuit.
6. Verification of torque for all nuts and bolts on buswork. Tighten connections in accordance with the manufacturer's specifications.
7. Measure, using a megger, the insulation of each bus section phase-to-phase; and phase-to-ground for one (1) minute each, at a minimum test voltage of 500 VDC for 208 volt systems. Minimum acceptable value for insulation resistance is 1 megaohms. Coordinate testing with the equipment manufacturer prior to any testing.

### **3.6 OPERATING AND MAINTENANCE MANUAL**

- A. Provide the manufacturer's operating and maintenance manuals for all switchboards. Manuals shall include spare parts data listing, source of replacement parts and supplies and as-built drawings.
- B. Provide the manufacturer's installation and maintenance instructions. Instructions shall be affixed to the cover of the incoming section of each equipment.
- C. Demonstration: Engage a factory authorized service representative to instruct personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories.
- D. Include time current coordination curves for each type and rating of overcurrent protective device.

### **3.7 AS-BUILT RISER DIAGRAM**

- A. Provide an as-built riser diagram of each distribution system mounted in a glass covered-frame. Media shall be high quality presentation type paper. Diagrams shall be located in the respective electrical room. A digital electronic version shall be submitted to the Commissioner.

### **3.8 UTILITY METER**

- A. Provide all required wiring and conduit between the Utility company C.T. compartment to the remote meter(s). Coordinate this work with the Utility Company during the application of service process.

### **3.9 FIELD QUALITY TESTING**

- A. Perform field testing in accordance with NETA Acceptance Testing Standards and to include, but not limited to, the following:



1. Perform resistance tests through all bus joints with a low-resistance ohmmeter. Any joints that cannot be directly measured due to permanently installed insulation wrap shall be indirectly measured from closest accessible connection.
  2. Perform insulation-resistance tests on each bus section, phase-to-phase and phase-to-ground.
  3. Bolt-torque levels shall be in accordance with the manufacturer specifications.
  4. Compare bus connection resistances to values of similar connections.
  5. Insulation-resistance values for bus, control wiring, and control power transformers shall be in accordance with the manufacturer's published data. Overpotential tests should not proceed until insulation-resistance levels are raised above minimum values.
  6. Apply overpotential test voltages in accordance with the manufacturer's recommendations. The insulation shall withstand the overpotential test voltage applied.
- B. Perform the following infrared scan tests and inspections and prepare reports:
1. Initial Infrared Scanning: After substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front and rear panels so joints and connections are accessible to portable scanner.
    - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
  2. Instruments and Equipment
    - a. Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
- C. Switchboard will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports; including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

### **3.10 FIELD SETTINGS**

- A. The Contractor shall perform field adjustments of the protective devices as required to place the equipment in final operating condition. The settings shall be in accordance with the final short-circuit study, ground fault protective device evaluation study, and protective device coordination study.
- B. Necessary field settings of devices and adjustments and minor modifications to equipment to accomplish conformance with the final short-circuit and protective device coordination study shall be carried out by the Contractor.



**3.11 INSULATION MATS**

- A. Provide a 36-inch-wide x  $\frac{1}{4}$ " thick insulation mat in the front and rear of the entire switchboard, rated for a dielectric test voltage of 30,000 volts.

**3.12 WARRANTY**

- A. Provide a five (5) year warranty from the date of substantial completion for all defects in materials and workmanship.

**END OF SECTION 26 29 19**



**SECTION 26 31 00  
SOLAR PHOTOVOLTAIC SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Procure and construct a complete, functioning grid interconnected photovoltaic (PV) system according to Contract Documents.
- B. The system shall consist of an array of photovoltaic modules with aluminum frames designed for grouping on racks, terminal and combiner box(es), quick-connect electrical connectors, DC wiring, DC disconnect, grid-connected inverter(s), AC disconnect, and a data acquisition and monitoring system (DAS). Wire the inverter to the building's electrical system and interconnect it with the utility grid.
- C. Conduct a fully operational system commissioning to demonstrate that the system functions as designed and make any changes necessary to achieve design intent.
- D. Provide labor, materials, and accessories required to furnish, install, start up, and commission a complete operating solar photovoltaic system.
- E. Coordinate, and incorporate the construction requirements of the Commissioner and local power service provider.
- F. Apply for and obtain utility interconnection with local power service provider.



### 1.3 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents:
1. Institute of Electrical and Electronics Engineers (IEEE)
    - a. IEEE 929 Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
    - b. IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems
  2. National Fire Protection Association (NFPA)
    - a. NFPA 70 National Electrical Code, 2014 edition.
  3. Underwriters Laboratories Inc. (UL)
    - a. UL 1703 Standard for Flat Plate Photovoltaic Modules and Panels
    - b. UL 1741 Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
    - c. UL699B Outline of Investigation For Photovoltaic (PV) DC Arc-Fault Circuit Protection
  4. 2011 New York City Building Code
    - a. Photovoltaic systems included in this contract shall follow Article 695 of NFPA 70, 2014 edition, in lieu of Article 695 of the NYC Building Code.
  5. 2014 New York State Building Code

### 1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Comply with the 2011 New York City Building Code and the rules, regulations and requirements of the utility companies serving the Project.
- C. PV system installer shall have local representation and shall have been actively engaged in installation and service of solar photovoltaic systems and inverters for a period of not less than 3 years.
- D. All equipment and installations shall meet or exceed minimum requirements of ADA, ANSI, ASTM, IEEE, IES, NEC, NEMA, NETA, NFPA, OSHA, SMACNA, UL, and FDNY.
- E. Equipment shall be certified for use in New York City.
- F. Maintain uniformity of manufacturer for equipment used in similar applications and sizes.



## 1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Proposal Submittal
  - 1. Written technical description of the proposed systems broken down into the following categories:
    - a. PV modules
    - b. Mounting system
    - c. DC disconnect compliance with rapid shutdown per 2014 NEC 690.12
    - d. Grounding system
    - e. DC/AC inverter
    - f. Utility interconnection
    - g. Visible blade AC disconnecting means
    - h. Data acquisition system
  - 2. Diagram showing proposed method for PV system grounding, including DC and AC connection to site grounding electrode.
  - 3. Diagram showing proposed method for complying with rapid shutdown requirements per 2014 National Electrical Code.
  - 4. Voluntary alternates to the base proposal may be presented, at the Subcontractor's option. All such alternates shall include a description of the item and benefits to the building operators and/or occupants. Creativity and ingenuity are encouraged in this regard; however, the impact imposed on the building's architecture and structure systems should be considered.
  - 5. For any voluntary alternates, demonstrate that power generating system components (i.e., PV modules and inverter) provide current and voltage outputs that meet or exceed the minimum requirement of the 2014 National Electrical Code.
  - 6. Demonstrate that any voluntary alternates for PV system equipment fit within the dimensions given on the Contract Drawings.
  - 7. Demonstrate that any voluntary alternates to mounting products or methods meet the design intent for a ballasted, non-penetrating rooftop PV array.
  - 8. Construction Specifications
    - a. CSI 2004 format



- b. General Electrical Provisions
  - c. Electrical Materials and Methods
- C. Manufacturer's product data sheets for all equipment. All irrelevant information shall be marked out leaving only pertinent data.
  - D. Operating and maintenance manuals for all system components.
  - E. Utility company and state PV incentive (rebate or PBI) calculations and application forms for eligible items for application for incentive.
  - F. Utility interconnection application complete for submission with all supporting documentation.
  - G. Shop drawings showing proposed PV mounting method signed and sealed by a qualified professional engineer licensed in the State of New York.

#### **1.6 IDENTIFICATION**

- A. Provide an identification nameplate for each photovoltaic inverter and each feeder overcurrent protection device.
- B. Provide additional markings and identification of equipment as required by NEC 690 and 705.

#### **1.7 COORDINATION**

- A. Coordinate layout and installation of PV array and balance of systems with all station structures, buildings, and equipment on site as necessary.
- B. Coordinate construction of array and other site work with Contractor and any other trades working on Site.
- C. Coordinate size and location of housekeeping bases, support points, and conduit routing with Contractor and other trades working on Site.

#### **1.8 ENVIRONMENTAL REQUIREMENTS**

- A. Operating Temperature: minus 20 degrees C to plus 45 degrees C.
- B. All outdoor equipment shall be NEMA 3R enclosed.

#### **1.9 WARRANTY**

- A. The PV system installation workmanship shall be warranted as specified in the purchase agreement but shall be no less than 1 year from the date of substantial completion. The solar photovoltaic system installer shall replace or repair any defective parts via pass through manufacturer's warranty within the first year of operation.



- B. The photovoltaic module power output shall be covered by the photovoltaic module manufacturer's warranty for a minimum of 20 years. The module workmanship shall be covered by the photovoltaic module manufacturer's warranty for a minimum of 10 years. These warranties shall be passed through the supplier to the customer.
- C. The inverter shall be covered by the manufacturer's warranty for a period of not less than 10 years and shall be passed through the supplier to the customer.
- D. System acceptance shall be granted after 30 days of AC power output within 10 percent of predicted power at operating test conditions.

## **PART 2 - PRODUCTS**

### **2.1 BASIS OF DESIGN**

- A. Photovoltaic Panels: Trinasolar Allmax 280W, 1000VDC Max or approved equal.
- B. Inverter: SMA Sunny Tripower 30000TL-US 30KW, 1000VDC or approved equal.
- C. DC Disconnect with Rapid Shutdown: SolarBOS Pass Through Contactor Unit, F2SK15C-1-4XP, 1000VDC or approved equal.
- D. Data Acquisition System: Deck Monitoring All-in-One Box, 208VAC, 3ph, or approved equal.
- E. PV Mounting System: Panel Claw Polar Bear III HD 10D, or approved equal.

### **2.2 RATINGS**

- A. All equipment shall be rated for operation at 1000VDC.
- B. Inverter:
  - 1. AC Output Voltage: Directly compatible with building or site distribution voltage without the use of an external voltage transformer
  - 2. Inverter AC Nameplate Rating: 12.5kW
  - 3. Total Harmonic Distortion: Less than 2 percent at rated power
  - 4. Inverter Peak Energy Efficiency: Greater than 95 percent
  - 5. Power Factor: Greater than 0.99 percent
  - 6. Arc Fault Current Interruption (AFCI) per UL1699B.
  - 7. Rapid Shutdown Capability: Reduce all PV circuits to 30 volts or less within 10 seconds, per 2014 NEC 690.12.



## 2.3 CONSTRUCTION

- A. The photovoltaic panels shall be complete with the following features:
  - 1. Compliance under ARRA 2009.
  - 2. Composed of crystalline silicon cells, enclosed in a corrosion-resistant heavy-duty frame with tempered low-iron anti-reflective coated glass and clear encapsulated insulation.
- B. DC Disconnect with Rapid Shutdown Capability shall be complete with the following features:
  - 1. NEMA 3R rating
  - 2. Rated for 1000VDC
  - 3. Capability to reduce DC PV circuits to 30 volts or less within 10 seconds, per 2014 NEC 690.12.
- C. The inverters shall be complete with the following features:
  - 1. Convection forced air cooling
  - 2. Islanding protection to meet IEEE 929 and UL 1741
  - 3. Protective Functions and Annunciation
    - a. AC over/under voltage
    - b. AC over/under frequency
    - c. Ground over current
    - d. Over temperature
    - e. AC and DC over current
    - f. DC over voltage
  - 4. User display
  - 5. AC and DC disconnects
  - 6. Arc Fault Current Interruption and Rapid Shutdown capability in compliance with 2014 NEC 690.12. Where the inverter is not located within 10 feet of the PV array, inverter must be capable of sending a signal to remote DC contactor to disconnect PV system conductors.
  - 7. Remote display monitor
  - 8. DC subcombiner



9. Maximum power point tracking
  10. Lightning arrester AC/DC protection
  11. Isolation transformer
  12. Communications software capable of remotely reporting kWh production
- D. Data acquisition system (DAS) shall be furnished with all equipment necessary to reliably measure PV system energy production including:
1. PV production meter
  2. Data logger, with appropriate voltage and current sensing and power supply
  3. The DAS should employ data recording intervals that correspond to utility demand billing scheme.
  4. The DAS should have backup storage power to key components so no data is lost during power outages. Device must be capable of holding 2 years of interval data for a 20 year period. The system shall continue to function after resumption of power.
  5. Failure of the building electrical normal power system shall not result in loss of data and will not require manual restarting of the metering system.
  6. Capability to transmit PV measurement data, either wirelessly or via Ethernet, to the Building Management System.
  7. Record site weather conditions (ambient temperature, module temperature, wind speed and direction, and solar irradiance). DAS system may utilize existing weather station on site if available.

#### **2.4 SAFETY FEATURES**

- A. The utility interactive inverter shall incorporate a maintained position on/off switch located on the enclosure. Under normal conditions, the on/off switch is in the ON position. Turning the switch to the OFF position will initiate a controlled shut-down and open the A/C contactor within the unit. The A/C contactor shall not close unless the switch is in the ON position. The inverter shall be prevented from being restarted until the on/off switch is turned back to the ON position.
- B. The system shall be equipped with ground fault detection circuitry. Upon detection of a ground fault, the system shall execute an orderly shut-down and annunciate a ground fault at the operator interface. The system shall remain faulted until the ground fault is remedied and cleared at the operator interface. This must be the only point of PV conductor ground.
- C. The system shall be equipped with PV arc fault circuit interruption functionality to detect an electric arc of 300W or more, and interrupt it within a maximum time period of two seconds. Inverter operation must immediately stop upon detection of an arc fault, interruption current flow across the arc. A manual restart process must be required to resume system operation.



- D. Anti-Island Protection: A digital phase-shift-loop circuit shall be implemented in the inverter controller to prevent "Islanding" of the system. In the event of a utility outage, these adjustments destabilize the feedback between the inverter and the remaining load, resulting in an over/under frequency or voltage condition. The system shall perform an orderly shut-down. The fault condition will remain until the utility voltage and frequency have returned to normal for 5 minutes.

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 FEES, PERMITS AND INSPECTIONS**

- A. Pay all required fees and obtain required permits and associated inspections related to the complete photovoltaic installation.
- B. Pay royalties or fees in connection with the use of patented devices and systems.
- C. Provide controlled or witnessed inspection where required by the 2011 New York City Building Code, or by these Specifications.

#### **3.3 INSTALLATION AND INTERCONNECTION**

- A. Inspect all equipment for damage upon arrival. Report any damaged equipment and obtain replacement(s) from manufacturer.
- B. Measure and record open circuit voltage and short circuit current of each module and compare the results to the manufacturer's specifications to ensure modules are within manufacturer's specified tolerances. If any modules are found to perform outside tolerance, deem module defective and do not install it. Record ambient air temperature and solar irradiance during field testing. Complete testing under constant solar irradiance and temperature conditions.
- C. Connect, mount, and ground the complete photovoltaic installation per manufacturer's instructions and Contract Drawings.
- D. Coordinate with the Electrical Contractor for building PV wiring and point of interconnection to the building distribution system and utility grid.
- E. Ship, store, and install products and materials in a manner that will protect them from physical damage, water damage, weather and entry of debris. If items are damaged in the opinion of the Commissioner, take immediate steps to obtain replacement or repair.
- F. Prepare and submit utility interconnection application and all supporting documents. Provide all required utility interconnection protection devices as required by the utility company.



### **3.4 TESTING**

- A. Submit PV module factory flash test data to the Commissioner for approval.
- B. Inverter shall be factory-tested for performance, and results shall be included in the O&M manual.
- C. Perform the system start-up procedure as outlined by the inverter manufacturer's installation manual.
- D. Perform fully operational PV system commissioning prior to system acceptance. System commissioning shall include the following, at a minimum:
  - 1. Verify that the installation is complete.
  - 2. Verify that the installation is safe.
  - 3. Verify that the installation is aesthetically acceptable.
  - 4. Verify that all components of the installation are robust and permanent.
  - 5. Document as-built conditions.
  - 6. Verify system performance and record results.
  - 7. Verify proper system operation.
  - 8. Establish performance benchmarks.
  - 9. Complete any required acceptance documentation.
  - 10. Instruct Engineering Services on basic system operation.
- E. Correct all installation defects identified during system commissioning.

### **3.5 MEASUREMENT AND VERIFICATION**

- A. Provide metering of instantaneous and continuous kW and kWh output with continuous integration for output to the Building Management System (BMS).
- B. Communications protocol shall be compatible with the building BMS.

**END OF SECTION 26 31 00**



**Department of  
Design and  
Construction**

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**SECTION 26 41 13  
LIGHTNING PROTECTION SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This Section specifies the lightning protection and grounding system for the building(s) or structure(s). This system provides facility protection for the building and occupants by preventing damage to the structure caused by lightning and induced transient currents. The design of this system shall be in strict accordance with this section of the specification and all Contract Documents that apply.
- B. The work covered under this section of the specifications consists of furnishing labor, materials and engineering services required for the completion of a functional and unobtrusive lightning protection and facility grounding system.

**1.3 STANDARDS**

- A. Except as modified by the Contract Documents, comply with the latest provisions and latest recommendations of the following:
1. Underwriters' Laboratories Master Label Code 96 and 96A, 2009 edition.
  2. NFPA 780, 2011 edition.
  3. Lightning Protection Installation Standard LPI-175, 2011 edition.
  4. 2008 National Electrical Code – NFPA 70 (NEC)



#### **1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. The contractor shall furnish a UL Certificate upon completion of the installation.
- C. The System Design shall be completed and the shop drawing stamped by the Contractor.
- D. The installing contractor shall be listed with the Lightning Protection Institute and Underwriters' Laboratories, Inc.
- E. The installation contractor shall have personnel on staff skilled in the installation of lightning protection systems.

#### **1.5 COORDINATION**

- A. Ensure that the installation, including air terminals, do not conflict with the operation of other rooftop systems. Where required, provide alternate components such as spring mounted air terminals to accomplish this coordination.
- B. Coordinate location of all ground inspection wells with the Commissioner.
- C. Coordinate location of Master Label mounting with the Commissioner prior to installation.

#### **1.6 ACTION SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Product Data: For each type of product
- C. Shop Drawings:
  - 1. Include layouts of the lightning protection system, with details of the components to be used in the installation.
  - 2. Include raceway locations needed for the installation of conductors.
  - 3. Details of air terminals, ground rods or plates, ground rings, conductor supports, splices, and terminations, including concealment requirements.
  - 4. Include roof attachment details, coordinated with the roof installation.
  - 5. Calculations required by NFPA 780 for bonding of metal bodies
- D. Coordination Drawings: Lightning protection system shop drawings, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
  - 1. Lightning protection cabling attachments to roofing systems and accessories.



2. Lightning protection strike termination device attachment to roofing systems, coordinated with the roofing system manufacturer.
3. Lightning protection system components penetrating roofing and moisture protection systems and system components, coordinated with the roofing system manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 STANDARDS**

- A. All materials shall comply in weight, size, and composition with the requirements of the UL 96 Materials Standards. All equipment shall be UL listed and properly labeled. The system furnished under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection equipment. Equipment shall be the manufacturer's latest approved design of construction to suit the application where it shall be used in accordance with accepted industry standards and with NFPA, LPI, & UL requirements.
- B. Surge Suppression products for the electrical service entrance shall comply with both NFPA 780 Sec 4.20 and UL 1449 4th Edition. Surge Suppression products for the communication service shall meet NFPA 780 Sec 4.20.

### **2.2 MANUFACTURERS**

- A. Heary Brothers.
- B. Approved Lightning Protection Co.
- C. Erico.
- D. AC Lightning Security.
- E. Harger Lightning Protection Co.
- F. ABB / Furse
- G. Lyncole
- H. VFC ZPen
- I. Or approved equal

### **2.3 TYPE OF SYSTEM**

- A. Install all conductors and complementary parts in a concealed manner so the completed work is unobtrusive and does not detract from the appearance of the structure.



- B. All areas of flat roofs shall be cross run with the same size conductor cable so that no area larger than 50 feet by 150 feet remains unprotected. Mount points on cast copper bronze point bases and cable clips to the finished roof to avoid any roof penetrations.
- C. All materials shall be copper. Aluminum shall be used on surface materials incompatible with copper.

#### **2.4 AIR TERMINALS**

- A. Air terminals shall be 3/8" x 12" solid copper nickel tipped and shall extend at least 10 inches above the object to be protected. All air terminal bases shall be cast bronze with stainless steel bolt-pressure cable connectors. The air terminals shall be spaced so as not to exceed 20' apart around the outside perimeter of the roof or the ridge and not over 50 square feet apart through the center of flat roof areas. All air terminal bases shall be equipped with bolt pressure cable connections and be securely mounted with stainless steel screws or bolts. Air terminals shall be located within 18" of roof edges and outside corners of protected areas.

#### **2.5 CONDUCTORS**

- A. Conductors shall consist of a U.L. listed #4/0 AWG with 28 strands of 14 gauge copper wire weighing 375 lbs. per 1000 feet and installed in accordance with the U.L. requirements. A perimeter conductor shall be installed around the entire main roof, and all penthouses and rooftop mechanical and electrical equipment. Each perimeter conductor shall be connected to at least two (2) down leads, providing a two (2) way path to ground from each air terminal. All center roof air terminals shall be interconnected with conductors to the outside perimeter conductor. Conductors on the flat roof areas shall be run exposed. Ground connections shall be made around the perimeter of each roof and to the main down conductor at a maximum of 100'-0" on centers.
- B. Utilize conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

#### **2.6 CONNECTORS AND FASTENERS**

- A. Use approved connectors of proper electrical and mechanical characteristics. Use only approved exothermic welded connections for all conductor splices and connections.
- B. Rigidly and permanently attach conductors and air terminals to the building with fasteners of proper strength and design.
- C. Fasteners shall be spaced not to exceed 3'-0" centers.



- D. All fasteners shall be provided with appropriate loop supports. No support penetrations shall be made in any sheet metal flashing or roof top equipment. Sheet metal screws shall not be used. Appropriate adhesive supports and construction mastic may be used on membrane roof surfaces only. Adhesive supports and construction mastic shall not be used on any sheet metal surfaces.

## **2.7 DOWN CONDUCTORS**

- A. The structural steel columns of the building may be used as the main down conductor from the roof to ground for the lightning protection system providing it is electrically continuous and is in compliance with UL 96A and NFPA 780. The steel columns used shall in no case average over 60' apart. Where the steel columns are used, a connection to the top of steel shall be made thru the roof using a 1" fiberglass sleeve.
- B. All pitch pans or proper roof membrane flashings shall be furnished, installed and weatherproofed by the roofing subcontractor.
- C. All 1" fiberglass sleeves shall be furnished, installed, weatherproofed and maintained free from obstructions by the electrical subcontractor. All vertical system conductors shall be concealed.

## **2.8 GROUND RODS**

- A. Ground rods and grounding perimeter grid shall be provided as part of the foundation electric package by the Contractor. Extend ground cable to the steel column and connect as indicated on the Contract Documents. Where the ground cable must be extended, all connections shall be made with exothermic welds.
- B. Ground rods shall be copper clad  $\frac{3}{4}$ " x 10' minimum. One (1) set of tripod ground rods shall be installed for each down conductor.
- C. Ground plates of high conductivity copper sheet, 20 gauge minimum, 24" square may be used in lieu of or in combination with ground rods to achieve the five (5) ohm resistance grounding system requirement. Conductor attachments to the ground plates shall be via cast bronze bond plate of eight (8) square inches of contact area.
- D. Ground rods and/or ground plates shall be installed a minimum of one (1) foot below grade and a minimum of two (2) feet away from the building foundation. All grounding locations shall be evenly spaced around the building perimeter as possible.
- E. A minimum of one (1) ground inspection well, rated for traffic of the installation area, shall be installed for each down conductor.
- F. Bonding of the grounding systems shall be with main size conductors. The bonding shall be accomplished to achieve equal potential of all grounds.



## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 GROUNDING SYSTEM**

- A. Common interconnection of all grounded systems within the building shall be accomplished using main size conductors and fittings. Grounded metal bodies located within the calculated bonding distance as determined by the formulas of the standards shall be bonded to the system using properly sized bonding conductors

### **3.3 GROUNDING OF METAL ELEMENTS**

- A. Interconnect and ground the mechanical piping system and equipment, antennas, satellite dishes, metal drain covers, ventilators, vent stacks, pipes, roofing or siding, ridge rolls, valleys, crickets, eaves troughs, downspouts, ladders, ducts, cold water supply piping, and any other metallic objects or surfaces of a size presenting a capacitance hazard, or within six (6) feet of any portion of the lightning protection system, including grade mounted items.

### **3.4 SERVICE AND TESTING**

- A. The installation of equipment shall be done under the direct supervision of the equipment manufacturer and per the manufacturer's requirements.
- B. The lightning protection installing contractor shall provide photos and/or video of the installation, including but not limited to, air terminal mounting, bonding connections (waterline and structural steel) down conductors, ground rods/plates/grids and all buried, concealed or inaccessible connections and components. This information shall be forwarded to the manufacturer for evaluation, certification, archiving and documentation. A copy shall be submitted to the Commissioner.
- C. The ground resistance of the completed system shall be measured using IEEE "Fall of Potential Method" in the presence of the Commissioner and shall be forwarded to the manufacturer. Ground resistance shall be five (5) ohms or less. Submit all testing data to the Commissioner.
- D. Include all results in the O&M manuals.

### **3.5 COORDINATION**

- A. The Contractor shall coordinate with other trades to insure a correct, neat and unobtrusive installation.
- B. The Contractor shall be responsible for bonding to the water services and/or electrical grounding system.
- C. The Contractor shall install approved "through-roof" connectors as specified. The roofing subcontractor shall be responsible for flashing, booting, or pitch panning all "through-roof" assemblies per roofing manufacturer's specifications



- D. Approved through-roof assemblies only with solid bronze or stainless steel rods shall be allowed to penetrate the roof. In no instance shall the conductor be allowed to penetrate the roof. The roofing subcontractor shall be responsible for flashing, booting, or pitch panning all "through-roof" assemblies per roofing manufacturer's specifications.
- E. Conductor cable bonded to the building's steel structure shall be attached utilizing approved bonding plates measuring a minimum of eight (8) square inches in size. Conductor cable embedded in concrete columns shall be bonded to column rebar at both top and bottom locations.
- F. A ground loop counterpoise shall be installed per NFPA-780 specifications. The counterpoise loop shall be interconnected to the structure to assure equipotential grounding.

### **3.6 CORROSION PROTECTION**

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration of corrosion of conductor. Contractor shall note that the air at the project site has a high salt content.

### **3.7 INSTALLATION**

#### **A. Lightning Protection**

- 1. The installation of the lightning protection system components shall be done in a neat and workmanlike manner.
- 2. Roof penetrations required for down conductors or for connections to structural steel framework shall be made using through-roof assemblies with solid bars and appropriate roof flashings. The roofing contractor shall furnish the methods and materials required at roofing penetrations of the lightning protection components and any additional roofing materials or preparations required by the roofing manufacturer for lightning conductor runs to assure compatibility with the warranty for the roof.
  - a. The roofing contractor shall be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. The lightning protection roof penetrations and/or method of conductor attachment should be addressed in the roofing section of the specifications.)

### **3.8 FINAL SYSTEM INSPECTION AND QUALITY CONTROL**

- A. The contractor shall furnish a UL Certificate upon completion of the installation.
- B. UL certification requires inspection by their third-party field staff after completion of the installation.
- C. As-Built Drawings shall be completed and issued by the Contractor.



- D. Final Inspection Report – A final test and inspection report shall be completed based on ANSI/TIA/EIA 607, NEC, NFPA 780, and UL96A industry standards as applicable. The scope of the inspection and report shall include;
1. Test and evaluation of the grounding system.
  2. Record final systems to ground resistance level.
  3. Evaluation and Testing of the internal bonding and grounding systems.
  4. Evaluation and Testing of equipment grounding.
  5. Evaluation of AC surge suppression installation.
  6. Evaluation of telco surge suppression installation.
  7. Copy of the UL Lightning Protection Certification.
  8. Final As-Built Review and submission.
- E. Report shall include detailed reporting and test results with corresponding photos of each evaluation category.

**END OF SECTION 26 41 13**



**SECTION 26 50 00  
LUMINAIRES AND ACCESSORIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Luminaires and Accessories.

**1.3 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
1. Underwriters Laboratories (U.L.)
  2. ASHRAE 90.1-2013 and the 2016 New York City Energy Conservation Code (N.Y.C.E.C.C.)
  3. 2011 New York City Electric Code (N.Y.C.E.C.)
  4. National Fire Protection Agency (N.F.P.A.)
  5. Certified Ballast Manufacturers Association (C.B.M.)
  6. Illuminating Engineering Society (I.E.S.)
  7. American Society for Testing and Materials (A.S.T.M.)
  8. American National Standards Institute (A.N.S.I.)



9. National Electrical Manufacturers Association (N.E.M.A.)
  10. ETL (Intertek Testing Service)
- C. Emergency and exit lighting shall comply with UL924.
- D. All luminaires and assembled components shall be new, of good quality, and approved by and bear the label of UL or other approved testing agencies (i.e., ETL) unless otherwise specified in writing. Documentation of such testing shall be provided upon request.
- E. Luminaires installed in outdoor protected areas (such as building soffits) and indoors in area subject to water or extreme humidity shall be UL Listed for damp locations. Luminaires in outdoor protected areas shall be UL Listed for damp and wet locations.
- F. LED color temperature values shall not deviate from three (3) McAdam ellipse threshold steps from ANSI color temperature target.

#### **1.4 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

#### **1.5 WARRANTY**

- A. The manufacturer's warranty shall cover the labor and material in this specification to be free from defects in workmanship and material for a period of five (5) years from substantial completion for all LED fixtures and control devices (occupancy sensors, switches, etc.). This shall include all components which fail due to defects in workmanship or material. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during warranty period shall be adjusted, restored, or replaced. Warranty shall also cover software assistance for a period of one (1) year.

### **PART 2 - PRODUCTS**

#### **2.1 FIXTURE MANUFACTURERS**

- A. Manufacturers are listed in the Lighting Fixture Schedule in the Contract Documents and within these specifications. The designations indicated on the Lighting Fixture Schedule are a design series reference (not necessarily a complete catalog number), and do not necessarily represent all of the special requirements as specified in the Contract Documents.
- B. Manufacturers:
1. Eaton/Cooper
  2. Philips



3. Lithonia
4. Or approved equal.

## 2.2 DRIVERS

### A. General

1. Provide drivers which are suitable for the electrical characteristics of the supply circuits to which they are to be connected, and which are suitable for operating the specified light sources.
2. Provide drivers that are listed with Underwriters Laboratories and bear the U.L. label. All drivers shall be designed, built and tested in accordance with ANSI and NEC standards.
3. Provide drivers having the lowest sound rating available for the lamps specified; clearly show their respective sound ratings. Replace drivers found by the Commissioner to be too noisy prior to substantial completion of the project.
4. Provide identical drivers within each fixture type. All drivers within the same luminaire must be of the same manufacturer.
5. Provide dimmer type drivers of design recognized and approved by U.L. These drivers shall coordinate with dimming control devices specified for the particular application.
6. Drivers shall be approved for the respective application. Approval shall be in writing from the driver manufacturer. The manufacturer shall perform an 8 hour documented test before installation verifying the driver and lamp temperatures will not exceed the manufacturer's published limits.
7. Provide UL listed damp/wet location drivers rated for appropriate climatefor for luminaires installed in outdoor unprotected areas.

### B. Solid State LED

1. Provide LED drivers with the following:
  - a. High power factor (95% or above)
  - b. Minimum starting temperature of 0°C.
  - c. Provide driver with sound rating of 'A.'
  - d. LED driver is UL listed.
  - e. Total harmonic distortion (THD) of less than 20%.



- f. LED driver is certified by UL for use in a dry or damp location. Outdoor drivers shall be weatherproof. Provide enclosure acceptable to the manufacturer to maintain driver criteria.
  - g. Provide input and output voltages, and wattage for operating.
  - h. Provide dimming standard (0-10V, etc.).
  - i. Inherent thermal protection.
- 2. LED drivers shall be installed within an electrical enclosure, unless it is rated as a remote mounted enclosure.
  - 3. LED color temperature shall be within a McAdam ellipse with three (3) threshold units.

### **PART 3 - EXECUTION**

#### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

#### **3.2 GENERAL**

- A. Fixture locations as indicated on the Contract Drawings are generalized and approximate. Carefully verify locations with the Contract Drawings, reflected ceiling plans and other reference data, prior to installation. Check for adequacy of headroom and non-interference with other equipment, such as ducts, pipes, conduit, or openings. Bring conflicts to the Commissioner's attention before proceeding with any work.
- B. Although the location of equipment may be shown on the Contract Drawings in certain places, actual construction may disclose that the work does not make its position easily and quickly accessible. In such cases, call the Commissioner's attention to this situation before installing this work, and comply with the installation instructions.
- C. Verify ceiling conditions and ceiling types prior to ordering any fixtures. Furnish appropriate luminaire mounting accessories for each fixture. Such mounting details shall be reviewed by the Commissioner.
- D. Install fixtures in mechanical areas after the ductwork and piping installation. Locate and mount fixtures as indicated on the Contract Drawings unless mechanical equipment prohibits or makes it impractical to do so. In such cases, chain or wall mount fixtures so that serviceable equipment is illuminated.
- E. Install fixtures complete with lamps, as indicated, and with equipment, materials, parts, attachments, devices, hardware, hangers, cables, supports, channels, frames and brackets necessary to make a safe, complete, and fully operative installation.



- F. Verify and provide fixtures that are appropriate for the ceiling mounting conditions of the project.
- G. Reject and do not install blemished, damaged or unsatisfactory fixtures. Replace imperfect or unsatisfactory fixtures, if installed, as directed by the Commissioner.
- H. When installed, fixtures shall be free of light leaks, warps, dents, or other irregularities. No light leaks are permitted at the ceiling line or from any visible part or joint of the fixtures.
- I. Provide finish for exposed parts or trims as specified or indicated on the Contract Drawings. If finish for exposed parts are not indicated, provide a finish as directed by the Commissioner.
- J. Do not install reflector cones, aperture plates, lenses, diffusers, louvers, and decorative elements of fixtures until completion of wet work, plastering, painting and general clean-up in the area of the fixtures.
- K. Mount fixtures at heights and locations indicated on the Contract Drawings, or as requested by the Commissioner.
- L. Adequately protect the housing of recessed lighting fixtures during the installation by internal blocking or framing to prevent distortion of sides, or dislocation of threaded lugs, which, upon completion, shall be in perfect alignment and match the corresponding holes in frames and rims. Holding screws shall be inserted freely without forcing, and shall remain easily removable for servicing. Threads intended to receive holding screws shall be chased after plating and finished to insure easy installation and removal of knurled headed screws.
- M. Parabolic luminaires shall be installed with mylar cover over louvers; cover shall be U.L. listed for temporary lighting. Upon completion of work, remove mylar cover with white gloves.
- N. Fixture supports shall, as a minimum, be adequate to support the weight of the fixtures.
- O. Provide visible hanging devices that are finished to match the fixture finish, unless indicated otherwise.
- P. Where necessary to meet fire resistance requirements set forth by the 2011 NYC Building Code, provide enclosure housings for recessed fixtures that are constructed to provide required fire resistance rating.
- Q. Provide attachment devices, including brackets, plaster rings, saddle hanger and tie bars, made of formed, rolled, or cast metal shapes with the requisite rigidity and strength to maintain continuous alignment of installed fixtures. Attach fixtures to the ceiling supporting members, and do not depend upon lathing, plaster or ceiling tile for alignment or support.
- R. Provide fixtures mounted in suspended ceilings that are supported by saddle hangers or the bars attached to runners or between crossbars of ceiling systems. Provide mounting splines or other positive means of maintaining alignment and rigidity.



- S. Provide pendant or surface mounted fixtures with required mounting devices and accessories, including hickeys, stud-extensions, ball aligners, canopies, and stems. Make mounting stems of pendant fixtures of the correct length to uniformly maintain the fixture heights shown on the Contract Documents or established in the field. The allowable tolerance in mounting individual fixtures shall not exceed ¼ inch and may not vary more than ½ inch from the floor mounting height shown on the Contract Drawings. Install fixtures hung in continuous runs absolutely level, and in line with each other. Hanging devices shall comply with 2011 NYC Building Code requirements.
- T. Provide hanging devices which, if visible from normal viewing angles, exactly match fixture finishes, unless otherwise requested by the Commissioner.
- U. Place stems to be vertical.
- V. Provide at least two (2) supports for individually mounted fluorescent fixtures. Where fixtures are ganged, provide supports at 8 ft. minimum intervals, unless otherwise indicated. All fixtures shall be supported to the structure or black iron. Fixtures and appliances shall not be supported by ceiling tiles, sheet rock, or plaster.

### **3.3 ACCESSIBILITY**

- A. Install equipment such as junction and pull boxes, fixture housings, transformers, ballasts, switches and controls, and other apparatus that requires occasional access for operation and maintenance, to be easily accessible and appropriate for mounting and ceiling conditions.

### **3.4 ADJUSTMENT**

- A. Provide manpower and tools for final focusing and adjustment, under the Commissioner's supervision, of all adjustable fixtures (including fixtures with variable socket positions) after regular working hours, whenever necessary.

### **3.5 CLEANING**

- A. Immediately prior to occupancy, clean reflector cones, reflectors, aperture plates, lenses, louvers, lamps and decorative elements. Destaticize lenses after cleaning, installing them to leave no finger or dirt marks. At the time of final observation, fixtures shall be clean and free from marks, dust, spotting or other defects. Replace any broken or defective parts prior to final inspection. Replace or make good all defects revealed by final observation.
- B. Remove labels and other markings, except the UL listing label.
- C. Regulated Waste Disposal
  - 1. All waste shall be labeled, stored, handled, transported, and disposed of in accordance with New York City Building Code and the New York City Department of Environmental Protection requirements.



2. All fluorescent lamps shall be assumed hazardous waste and shall be boxed and removed to an approved lamp recycler. Provide required documentation and comply with all hazardous waste regulations.
3. All ballast waste shall be labeled, stored, handled, transported and disposed of in approved plastic lined drums. Contractor shall arrange for the proper disposal of the ballasts with an approved recycler. Provide all required documentation and comply with all hazardous waste requirements.

### **3.6 FIELD QUALITY CONTROL**

- A. Inspect each installed fixture for damage then replace damaged fixtures and components. Verify normal operation of each fixture after installation.
- B. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify normal transfer to battery power or emergency power source and retransfer to normal.
- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. Retest to demonstrate compliance with specification requirements where adjustments are made. Replace fixtures with damage or corrosion during guarantee period.

### **3.7 SITE INVENTORY**

- A. Submit Operations and Maintenance instructions, including parts list, for each luminaire installed.

**END OF SECTION 26 50 00**



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**SECTION 28 31 00  
FIRE ALARM LIFE-SAFETY SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. Provide new fully addressable fire alarm system with new FACP, DGPs, detectors, notification appliances, etc.
- B. Provide necessary equipment and/or devices reprogramming of any remaining components of the existing building fire alarm system to meet the requirements of new work.
- C. Ensure that the existing sprinkler alarm system remains in operation until the new fire alarm system has been installed and approved for use.

**1.3 SMOKE DETECTION**

- A. Provide addressable type duct smoke detectors.
- B. Activation of duct smoke detector will initiate the fire alarm following base building sequence of operations and shut down the associated HVAC unit and fan.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Secure permits and approvals, prior to installation.
- C. Prior to commencement and after completion of work: Notify Fire Department and Commissioner.



D. Meeting requirements of:

1. NFPA National Fire Code.
  - a. NFPA 70, 2008 edition, articles 300, 400, 685.
  - b. NFPA 72, 2010 edition.
  - c. NFPA 90A, 2009 edition.
2. 2011 NYC Building Code.
3. FDNY.
4. Underwriters Laboratories or Factory Mutual Inc.

E. Install and connect in accordance with manufacturer's recommendations and instructions.

**1.5 SEQUENCE OF OPERATION**

- A. Operation of all new devices connected to existing fire alarm system shall match present operation.
- B. Duct smoke detection activation will shut down the corresponding active unit via Fire Alarm System.

**1.6 JOB CONDITIONS**

- A. Maintain operation of building existing alarm system and devices during construction. Coordinate with building manager for scheduling system shutdown and interconnections.
- B. Test and document existing fire alarm system prior to start of construction.

**1.7 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.
- B. Submit letter of approval from FDNY for installation before requesting acceptance of system.
- C. Shop drawings:
  1. Provide complete dimensioned shop drawings including mounting and installation details, sequence of operations and wiring diagrams and catalog cut sheets for the following equipment;
    - a. Smoke and heat detectors.
    - b. Signal and communication wires.
    - c. Duct detectors, including remote indicator lights or mimic panel.



- d. Relays for HVAC units control, fan shutdown and damper closing.

## **1.8 WARRANTY**

- A. Provide a manufacturer's warranty for a period of (2) years starting from the date of substantial completion for all materials and labor.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Flush and surface mounted combination horn/strobes, area smoke and duct detectors, wiring, addressable manual pull station, etc., are to comply with the existing building standard.
- B. Area smoke detectors shall be photo-electric type.
- C. Strobes shall meet the requirements of the A.D.A.
- D. Speaker/strobe units shall be semi-flush mounted with all necessary trim.

### **2.2 MANUFACTURERS**

- A. Siemens shall be the only acceptable manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

### **3.2 INSTALLATION**

- A. Install new manual pull stations and fire alarm devices to new wall surfaces and in accordance with ADA requirements. Install new combination horn/strobes in accordance with ADA requirements.
- B. Provide connection to fire alarm panel for new devices, relays, strobe panel.
- C. Reprogram the main control board and fire command station to accept the new equipment and devices.
- D. Adjust speaker taps for proper coverage of the area.
- E. New smoke duct detectors to report to the fire alarm control panel. Coordinate with building fire alarm system vendor.
- F. All hard wiring to be Teflon in EMT conduit to conform to 2011 NYC Building Code requirements.

**END OF SECTION 28 31 00**



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**SECTION 31 23 33  
EXCAVATION AND FILLING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The following related documents apply to all required work for the project:
1. The Contract Drawings.
  2. The Specifications.
  3. The General Conditions.
  4. The Addendum.
  5. The Contract [City of New York Standard Construction Contract].

**1.2 SUMMARY**

- A. This section describes Excavation and Filling.

**1.3 SUBMITTALS**

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures" for all submittals.

**1.4 QUALITY ASSURANCE**

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

**1.5 DESCRIPTION**

- A. The location, general character and essential details shall be as specified and as shown on the Contract Drawings.
- B. Earth Excavation shall include the removal and disposal of material of whatever nature encountered in the prosecution of the work, unless otherwise specified. Materials of whatever nature encountered shall be defined as including, but not be limited to, soil, stones, soft weathered rock that can be removed by mechanical means other than air hammer or drilling and blasting, and miscellaneous fill (excluding contaminated materials, debris and building demolition material consisting primarily of large wooden objects, plastic, asphalt shingles, metals, etc.) which is not classified as rock excavation or contaminated or hazardous materials that materially affect the cost of removal and disposal to the Contractor.
- C. Earth excavation shall not include the cost of excavation and disposal of boulders or parts thereof more than one-half (1/2) cubic yard in volume (to be measured by multiplying the maximum cross section area by seven



tenths (7/10) of the length of that which is to be removed) in open cuts, rock, materials which must be removed and disposed of as contaminated or hazardous material, manmade objects or structures not shown on the Contract Drawings or indicated in the specifications, that could not reasonably have been anticipated by the Contractor, were not anticipated by the City, and which materially affect the cost of excavation and disposal to the Contractor. Filling shall include the furnishing, re-use, placement and compaction of approved material required.

- D. Excavation in earth for the footings of structures shall be carefully conducted so as to approach the neat lines as closely as possible without disturbing the underlying soil and hand excavation shall be used within the last twelve (12") inches. Under no circumstances shall any backfilling material be placed upon surfaces to be used as foundation for footings. Where, in the opinion of the Commissioner, the slope of existing rock surfaces requires it, rock shall be suitably benched to give full and proper bearing to concrete in accordance with the directions of the Commissioner. Rock surfaces shall be cleaned and if necessary washed before concrete is poured.

## **1.6 MATERIALS FOR FILL AND BACKFILL**

### **A. General**

1. All material for fill or backfill shall have an optimum moisture content as determined by the Standard Proctor Test conducted in accordance with AASHTO T-99 Method.
2. All material for fill or backfill shall be free from frost at the time of placement.
3. Miscellaneous fill material removed from trenches and excavations shall not be considered as acceptable backfill material unless found to be in compliance with these specifications and approved in writing by the Commissioner. The project site subsurface conditions may consist partially of variable thickness layers of unsuitable material. This material may not be considered to be acceptable backfill material as described herein, or as determined by the Commissioner.

### **B. Fill and Backfill**

1. Filling and Backfilling materials whose composition is inorganic soil, blasted or broken rock and similar materials of natural or man-made origin, including mixtures thereof, shall be considered suitable materials provided it is free of shale or other soft, poor durability particles.
2. Glass from recycling facilities that meets the requirements of Subsection 4.11.3.(E) shall be considered suitable material for mixing with fill provided the Contractor maintains the gradations specified herein. However, glass shall not be placed in contact with synthetic liners, geogrids, geotextiles or other geosynthetics.
3. Glass and/or RPA incorporated into fill shall be thoroughly mixed with other suitable material so that glass, RPA or combination of both constitutes no more than 30 percent by volume anywhere in the fill as visually determined by the Commissioner.
4. The material within the top one (1') feet of subgrade shall have the following gradation:



<b>Sieve Size</b>	<b>Passing Percent By Weight</b>
4 inch	100
¼ inch	30 to 75
No. 40	5 to 40
No. 200	0 to 10

5. Stone in filling shall not exceed the following maximum dimensions:

More than thirteen (13') feet below grade.....	Unlimited
More than four (4') feet and less than thirteen (13') feet below grade.....	2'-0"
More than one (1') feet and less than four (4') feet below grade.....	1'-0"
Within one (1') feet of grade.....	0'-4"
Within two (2') feet of structures.....	1'-0"
In embankment slopes beyond street lines.....	1'-0"
Within five (5') feet of the center line of existing or proposed sewers, water mains and their appurtenances.....	1'-0"

6. The Contractor may use, as fill, that portion of the excavated material conforming to these specifications. However, all materials used for fill shall be free from organic material and other unsuitable material. The only exception would be the allowable contamination of recycled glass.
7. Excavated materials not complying with the above specifications shall be considered unsuitable for fill and shall be removed from the job site to an approved dump.

**C. Select Granular Fill**

1. Select Granular Fill shall be a natural sand, well graded crushed stone or approved clean earth of low silt and clay content, free from bricks, blocks, excavated pavement materials and debris, stumps, roots and other organic matter, as well as ashes, oil and other perishable or foreign material. All materials furnished under this item shall have no particles greater than 1/4 inch in maximum dimension for use in trenches and shall have the following gradation:

<b>Sieve Size</b>	<b>Percent Passing By Weight</b>
¼ inch	100
No. 40	0-40
No. 200	0-8

**D. Processed Fill**

1. If approved in writing by the Commissioner, excavated material determined to be unsuitable for fill may be processed (i.e. screened and/or crushed) to produce select granular fill material or fill material. Such processed materials for backfill must comply with the material specifications herein for either Select Granular Fill or for Fill, as required. (Excavated material that is hand groomed and/or groomed with the



use of excavating equipment of bricks, blocks, pavement materials, debris, stumps, roots, stones, boulders, timber, wood, etc., so as to render the excavated material acceptable for backfill, whether ordered by the Commissioner or at the Contractor's own discretion, shall not be considered as processed material but shall be considered as approved excavated suitable material.

E. Glass

1. Glass shall be crushed to a maximum particle size of 3/8 inch.
2. Glass may contain up to a maximum of five (5%) percent by volume of china, ceramics, plate glass products, paper, plastics or other deleterious materials. The material shall be subject to visual inspection by the Commissioner, and may be rejected based on this inspection. In case of rejection, the inspection must be documented in writing by the Commissioner who shall indicate the basis of rejection.

**1.7 EARTH EXCAVATION METHODS**

A. Excavation for walls and other structures shall be made to the dimensions specified and shall be done as follows:

1. General: Trenches and pits shall be excavated to the depths required for cradle and foundation of structures. All trenches in earth shall be excavated with vertical sides, and shall be supported by close sheeting, properly braced. Sheeting and bracing shall extend from at least the existing surface of the ground to an adequate depth below the subgrade of the structure, except where otherwise specified on the Contract Drawings, or permitted by the Commissioner in writing. Sheeting must be driven below the area of the pilot cut. Driving of sheeting above the pilot cut is subject to the directions of the Commissioner.
2. Pilot cuts for trenches shall not exceed five (5') feet at any time. The Commissioner may reduce the depth of the pilot cut should soil and subsurface conditions warrant such action.
3. The Commissioner may direct the Contractor to use other types of equipment, and to revise the procedure during the excavation of the pilot trench and the driving of the sheeting should it be found necessary to do so.
4. In accordance with 29 CFR 1926.650, a trench is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than fifteen (15') feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to fifteen (15') feet or less, the excavation is also considered to be a trench. The Contractor shall provide protection from collapse and cave-in for any employee who enters a trench or other excavation in accordance with the requirements of 29 CFR 1926 Subpart P, unless the excavation is less than five (5') feet in depth and examination of the ground by the Contractor's "competent person" provides no indication of a potential cave-in. The Contractor shall include the proposed procedures to meet the excavation safety requirements in his Project Safety and Health Plan. Trenching and excavation work shall be carried out under the supervision of the Contractor's "competent person."



5. The Contractor shall provide ladders or ramps for access and egress within twenty-five (25') feet of an employee work area if a trench is four (4') feet or more in depth. The Contractor shall keep traffic, equipment and materials at least two (2') feet away from the edge of any trench or excavation, or use retaining devices. When mobile equipment is operated near an excavation or must approach the edge of an excavation, either the operator must have a clear and direct view of the edge of the excavation; or a warning system of barricades, hand signals or mechanical signals shall be used. Workers shall not be permitted under loads that are being handled by lifting or digging equipment.
6. Trenches under five (5') feet in depth need not be sheeted and braced, except where one of the following conditions exist: the trenches are in close proximity to existing structures or subsurface structures; where the Commissioner, in writing, specifically prohibits the use of a non-sheeted trench; or where examination of the ground by a "competent person" provides indication of a potential cave-in, and trenches need to be sheeted and braced.
7. For the purposes of open excavations and trenches, the term "competent person" shall be defined as a person designated by the Contractor, in writing, who has had specific training in, and is knowledgeable about, soil analysis, the use of protective systems and the requirements of 29 CFR 1926 Subpart P, who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
8. Where shown, specified or permitted in writing by the Commissioner, the sides of the trenches shall be sloped to elevations approved by the Commissioner. Side slopes must be stable and shall be, in the dry, at least one and one half (1-1/2) vertical on one (1) horizontal.
9. The subgrade of trenches shall be constructed neat and to the grades as shown in the Contract Documents, and as directed by the Commissioner.
10. Upon completion of the trenches and excavations and prior to placement of structures, the Contractor shall take in-place soil density tests of the subgrade (the number and locations of these tests shall be as directed by the Commissioner), and shall compact the subgrade, as directed by the Commissioner, to a minimum of ninety-five (95) percent of Standard Proctor Maximum Dry Density.
11. Additional Requirements for Trenches
  - a. Any widening or enlargement of excavation permitted in writing by the Commissioner upon the request of the Contractor in order to perform the work as specified in the Contract Documents and/or to expedite their construction operations.
  - b. In rock trenches the Contractor may, with the written permission of the Commissioner, omit the use of side forms. No rock shall project inside the minimum width vertical rock cut lines herein specified.
  - c. Where the Contractor elects to cut his trench in rock by means that will result in overbreakage, rather than resorting to means which will insure adherence to the maximum allowable width of trench, he shall be required to fill the spaces between the edges of the external neat line of the



poured-in-place structure and the sides of the rock cut with concrete, from subgrade of trench to a minimum height of two (2') feet above the top of the footing.

- d. If the Contractor elects to carry the excavation in earth below the required subgrade of the trench, the Contractor shall backfill the trench to the required subgrade with either properly compacted Stone Ballast or with concrete, as directed by the Commissioner. If the Contractor elects to carry the excavation in rock below the required subgrade of the trench, the Contractor shall backfill the trench to the required subgrade with concrete or stone ballast as directed by the Commissioner.
12. Disposal of Water From Excavations: The Contractor shall at all times during the progress of the work keep the trenches and excavations free from water. The water from the trenches and excavations shall be disposed of in such a manner as will not cause injury to the public health, nor to public or private property, nor to the work completed or in progress, nor to the surface of the streets, nor cause any interference with the use of the same by the public. All sewers used for disposal of water from the trenches and excavation during construction shall be acceptably cleaned.
  13. When in order to comply with the above, it is deemed necessary to widen the trench beyond the allowable maximum width, to permit the installation of well-points, the Contractor shall, as directed by the Commissioner, provide either pipe of additional strength or concrete encasement at no additional cost to the City.
  14. The Contractor shall, with their own equipment, provide dewatering where required.
  15. All pumps used in the dewatering operation shall be electric and shall be powered directly from a Con Edison drop, unless otherwise unavailable.
  16. Where the subgrade of the trench cannot be maintained in a dry condition, except in locations where the structures are on piles, the Contractor shall excavate the trench to an additional depth of six (6") inches below the subgrade of the sewer and backfill the trench to the subgrade of the sewer with stone ballast.
- B. Approved sheeting and bracing shall be used where necessary to support sides of excavation, in order to: prevent damage to subsurface structures and adjacent buildings; safeguard persons and property; minimize inconvenience to traffic and the public; protect the structure to be installed; and, provide suitable and safe working conditions. Except as otherwise provided, deviations from the above will be permitted only where, in the judgment of the Commissioner, such exception will not result in any of the hazards described above.
  - C. In cases where sheeting and bracing will not adequately protect adjacent structures from damage and settlement, the Contractor will be required to use such methods as are necessary to safely support and maintain adjacent and abutting property and structures and to maintain the work safe to life, limb and property.
  - D. Unless otherwise specified in the Contract Drawings or these Specifications or specifically permitted in writing by the Commissioner, the Contractor shall be required to withdraw and remove all sheeting and bracing simultaneously with the backfilling of trenches and excavations.
  - E. Unless otherwise permitted, all earth excavation which is suitable and needed for fill shall be used within the contract limits.



## **1.8 BACKFILLING METHODS**

### **A. Backfilling Around Structures**

1. Unless otherwise specified or directed, all trenches and excavations shall be backfilled immediately after the structures are built and inspected, and permission to backfill has been granted by the Commissioner.
2. All backfill shall be carefully deposited and spread by approved methods.
3. Backfill shall proceed simultaneously with the withdrawal of sheeting. Withdrawal of sheeting below levels previously backfilled and compacted is prohibited.
4. The use of backhoe buckets for the compaction of backfill material in all trenches and excavations will not be permitted.
  - a. **Select Granular Fill.** The Contractor shall use Select Granular Fill for backfilling trenches and excavations within any area less than two (2') feet wide in its least dimension (i.e. space between face of trench and outside face of cavities behind sheeting, filling of voids left by removal of boulders beyond the limits of sheeted trench, etc.) and within eighteen (18") inches around all underground facilities (i.e. conduit, cable, etc.).
  - b. Select granular fill shall be deposited and spread by approved methods in uniform horizontal layers not exceeding twelve (12") inches in depth and each layer shall be thoroughly compacted to the satisfaction of the Commissioner, before a successive layer is deposited. A minimum of 95 percent of Standard Proctor Maximum Density will be required after compaction.
5. All excavated material from within the project limits which is considered as suitable material under the requirements of Subsection 4.11.3.(B), shall be utilized for backfill.

### **B. Backfilling Around Sheeting**

1. When sheeting is withdrawn all cavities remaining in or adjoining the trench shall be filled and compacted. When sheeting is left in place all cavities behind such sheeting shall be filled as directed. All materials used for such backfill and the compaction of such materials shall be as specified herein.

### **C. Subgrade Structures Not to Be Covered**

1. Subgrade structures shall not be covered until the Commissioner shall have inspected, measured and located the same and given permission to backfill the trenches over them.

### **D. Fill**

1. Fill shall be deposited, satisfactorily compacted, and maintained until the entire work is accepted, between
  - a. the subgrade of proposed pavement and the surface of proposed curbs and sidewalks and the existing ground surface;



- b. the planes of the slopes of the embankment or the backs of retaining walls, as specified;
  - c. rock subgrade and the finished surfaces of roadways and sidewalks.
2. Embankment slope shall be one and one-half (1-1/2) horizontal to one (1) vertical.
- E. The Contractor shall fill or backfill with material having a moisture content suitable for the proper compaction of that material. The Contractor shall be responsible for determining the proper limits as the work is progressed. Water added shall be thoroughly incorporated into the soil, and manipulation shall be provided whenever necessary to attain uniform moisture distribution to the soil. When the moisture content of a lift, that is about to be compacted, exceeds the required amount, compaction shall be deferred until the required moisture content is achieved or a more suitable material shall be used. Fill material shall be carefully deposited and spread by approved methods in uniform horizontal layers not exceeding twelve (12") inches in depth, extending across the entire width of fill prior to compaction, and each layer being thoroughly compacted to the satisfaction of the Commissioner before a successive layer is deposited. A minimum of 95 percent of Standard Proctor Maximum Density will be required after compaction.
  - F. When placing fill or backfill around underground facilities in shallow excavations, twelve (12") inch layers shall be deposited to progressively bury the facility to equal depths on both sides and for the full depth and width of the trench excavated for the facility.
  - G. Backfill immediately adjacent to conduits shall not contain particles larger than one quarter (1/4") inch in diameter. Compaction shall be attained by the use of impact rammers, plate or small drum vibrators, or pneumatic button head compaction equipment and shall be capable of exerting a pressure equivalent to two hundred and fifty (250) to three hundred (300) pounds per inch width of compression roll, or an equivalent pressure if other than smooth wheel or pneumatic tired rollers are permitted.
  - H. Hand tamping will not be permitted except in the immediate area of the underground facility.
  - I. The backfill, within two (2') feet of such facilities, shall be wetted (except where clay is present) in twelve (12") inch lifts and lightly hand tamped with as many strokes as required to achieve maximum density.
  - J. Where sheeting has been used for the excavation, it shall be pulled when the excavation has been filled or backfilled to the maximum unsupported depth allowed by New York State Department of Labor Industrial Code Rule 23 and Title 29 Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction. Where a difference exists between regulations, the more stringent requirements shall apply.
  - K. In-place soil density tests will be required to ensure that the soil compaction requirements of the specifications are met. In-place soil density tests shall be taken for each and every layer of backfill placed, at a maximum of one hundred (100') feet intervals along the length of each layer. However, the location of the tests shall vary horizontally along each successive layer, such that no two (2) tests are conducted at the same station location as any previous layers. The number and locations of in-place soil density tests shall be as directed by the Commissioner.
  - L. For each one thousand (1,000) cubic yards of each type of backfill soil utilized, for which in-place soil density tests are to be performed, shall undergo a minimum of one (1) Proctor analysis in order to determine the maximum dry density and optimum moisture content of the soil material to be tested. Due to varying soil



conditions, additional Proctor analyses may be required by the Commissioner. The number and locations of all samples to undergo Proctor analysis shall be as directed by the Commissioner.

- M. The Contractor shall retain the services of a testing laboratory, in accordance with Section 7.12 - Soil Density Testing, to make all compaction tests of backfill materials used and placed. All compaction tests shall be witnessed and verified by the Commissioner. Proctor analyses and in-place soil density tests shall be performed in accordance with Section 7.12.
- N. The Contractor shall furnish the Commissioner with copies of in-process compaction reports certified by a Professional Engineer licensed in the State of New York as to the compliance with the requirements of the aforementioned filling and backfilling specifications. This certified compaction report shall be submitted as directed by the Department's Quality Assurance and Construction Safety Unit.

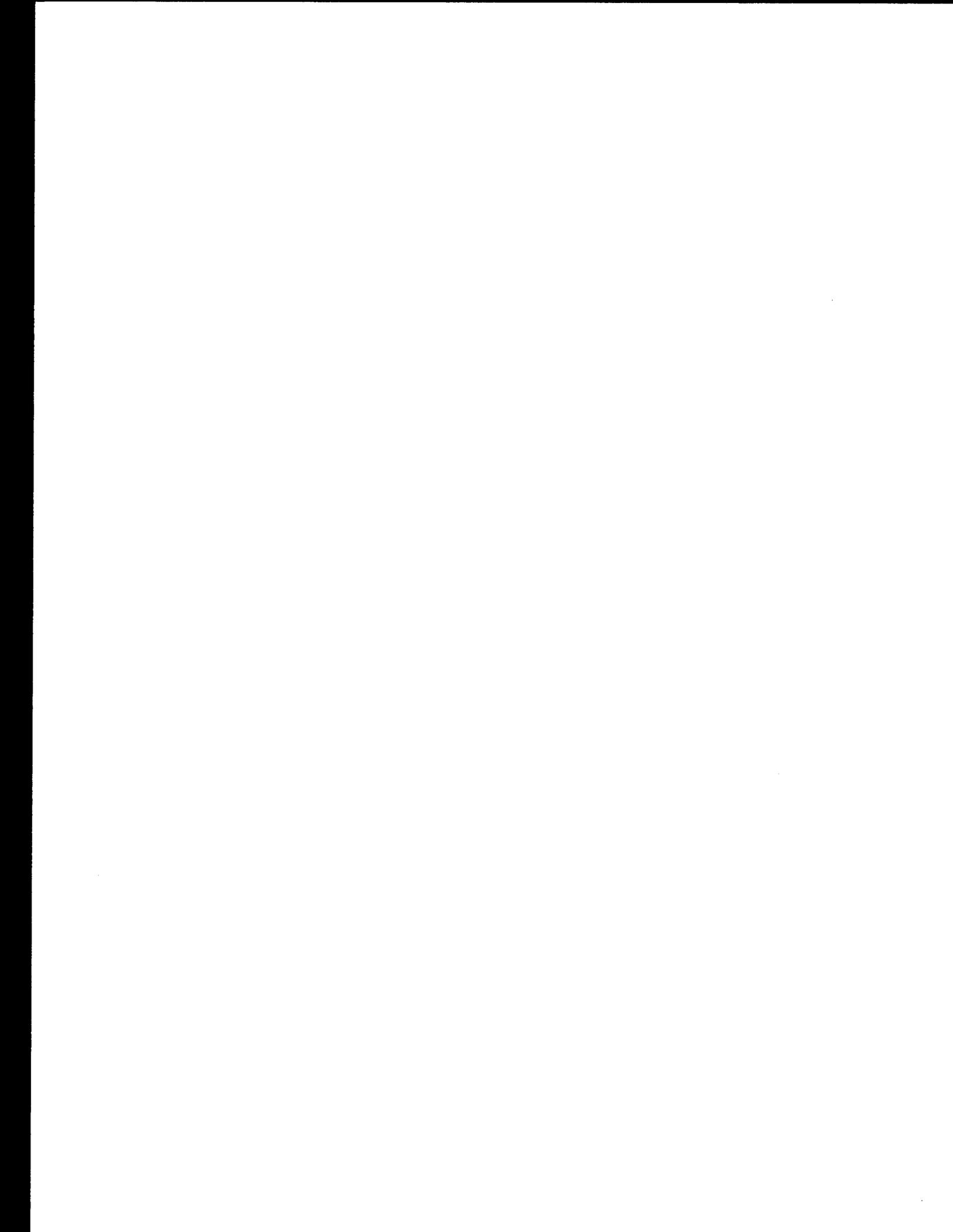
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THE CITY OF NEW YORK  
DEPARTMENT OF DESIGN AND CONSTRUCTION  
DIVISION OF PUBLIC BUILDINGS

October 17, 2019

**ADDENDUM No. # 1**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**S136-383S**

**DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

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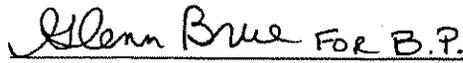
The bidder is advised that the items listed below apply to the project:

1. **Bidders Questions and Responses to Questions:**  
See Attachment A.

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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) 391-1016, by email at [CSB\\_projectinquiries@ddc.nyc.gov](mailto:CSB_projectinquiries@ddc.nyc.gov) or by fax at (718) 391-2627.

  
Bogdan Pestka, FAIA  
Assistant Commissioner  
DEP / Sanitation / Transportation /  
Tanks Programs

Delric Construction Co., Inc.

Name of Bidder

By:

  
Anthony Della Cerra, Vice President

**DDC PROJECT #: S136-383S**

**PROJECT NAME: DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

**ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES**

<b>No.</b>	<b>Bidders Questions</b>	<b>DDC Responses</b>
1	The Duct Cleaning Specification 233320 does not clearly indicate to clean the existing Duct System. Please confirm we are only doing new duct systems.	Specification Section 233320 is applicable to cleaning the entire system, including all existing and new duct. Refer to the specification section and Drawing M-001, scope of work/new work note 5, which identifies that the existing system shall be cleaned.



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

October 24, 2019

**ADDENDUM No. # 2**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**S136-383S**

**DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

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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:

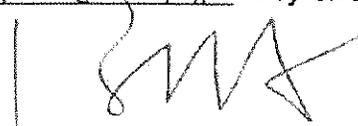
1. **Bidders Questions and Responses to Questions:**  
See Attachment A.

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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) 391-1016, by email at [CSB\\_projectinquiries@ddc.nyc.gov](mailto:CSB_projectinquiries@ddc.nyc.gov) or by fax at (718) 391-2627.

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Bogdan Pestka, FAIA  
Assistant Commissioner  
DEP / Sanitation / Transportation /  
Tanks Programs

Delric Construction Co., Inc.

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Name of Bidder

By:   
Anthony Della Cerra, Vice President

**DDC PROJECT #: S136-383S**

**PROJECT NAME: DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

**ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES**

No.	Bidders Questions	DDC Responses
1	Will an addendum will be posted with responses to outstanding RFI's and/or a bid extension for this project?	There will be no extension for this project.
2	Drawing E-010 Note #3 refers to Drawing E-012. However that drawing is not in the bid set.	Note referenced is not applicable and may be considered not used.
3	Can you please provide a copy of asbestos survey that was conducted to determine the asbestos abatement scope of work?	Asbestos related information is included in the Bid Documents.
4	Please clarify what note 26 on H001.00 scope of work entails with respect to sealant. Please give an example.	Per NYS DOL and NYC DEP regulations, the notes 23 and 26 on the drawing H001.00 (asbestos abatement general notes) are not applied for roof abatement job.
5	As stated on note 23 on H-001.00, will fire watch be needed for a full 24 hours even if abatement is conducted in one 8-hour shift per work day?	Per NYS DOL and NYC DEP regulations, the notes 23 and 26 on the drawing H001.00 (asbestos abatement general notes) are not applied for roof abatement job.
6	It is not clear how the allowance for Building Management and Control Systems is \$233,884. Does the allowance include all materials (control valves, actuators, panels, etc.) and control wiring?	Yes, the \$233,884 estimate applies to all of the material scope/cost in Specification Section 230923.
7	Please advise who the house Honeywell BMS vendor is including their contact information.	There is no current BMS at the site, therefore no house Honeywell system or contact. The contractor should contact their local (NYC) Honeywell rep for their purposes.
8	Please clarify the Insulation and jacketing requirements for Supply and Return Air Ductwork exposed on the roof. The specification is not clear on this.	All supply and return air ductwork exposed on the roof requires insulation and jacketing as noted in Specification 230700.
9	Does the DDC provide an excel version of the bid breakdown sheets?	The excel Bid Breakdown will not be provided prior to bid.



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

October 25, 2019

**ADDENDUM No. # 3**

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

**S136-383S**

**DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

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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. **The Bid Opening for the contract described below scheduled for October 25, 2019, at 2:00 pm is rescheduled to October 29, 2019, at 2:00 pm.**  
Contract #1 – General Construction Work
2. **Bidders Questions and Responses to Questions:**  
See Attachment A.
3. **Revisions to the Drawings:**  
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) 391-1041 by email at [CSB\\_projectinquiries@ddc.nyc.gov](mailto:CSB_projectinquiries@ddc.nyc.gov) or by fax at (718) 391-2627.

  
Bogdan Pestka, FAIA  
Assistant Commissioner  
DEP / Sanitation / Transportation /  
Tanks Programs

Delric Construction Co., Inc.

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Name of Bidder

By: 

Anthony Della Cerra, Vice President

**DDC PROJECT #: S136-383S**

**PROJECT NAME: DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

**ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES**

No.	Bidders Questions	DDC Responses
1	Service duct bank calls for 12 Conduit on E-011, but the Riser Drawing E-503 calls for 11 sets 4-500+1-500 in 4" with +2 4" spares, so the total is 13 Conduit. Please clarify.	Provide 11 sets 4-500+1-500 in 4" with + 1- 4" spare.
2	Riser E-503 shows DP-PV on 1st Floor. Please show us the location on floor diagram.	DP-PV shall be located in electrical room as indicated in Riser Diagram. See revised floor plan for clarification on DP-PV location based on the Riser Diagram, included in Attachment B, Revisions to the Drawings.

**DDC PROJECT #: S136-383S**

**PROJECT NAME: DSNY District SI 3 Garage and Repair Shop – HVAC System and Roof Replacement**

**ATTACHMENT B – REVISIONS TO THE DRAWINGS**

**REFER TO DRAWING E-202**

1. On the PARTIAL FIRST FLOOR PLAN DRAWING: DP-PV Location per the Riser Diagram was identified.

FMS ID: S136-383S



Department of  
Design and  
Construction

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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

# **DSNY SI District 3 Garage 7 Repair Shop HVAC System & Roof Replacement**

LOCATION:                      1000 West Service Road  
BOROUGH:                    Staten island, NY 10314  
CITY OF NEW YORK

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Contractor

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

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Entered in the Comptroller's Office

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First Assistant Bookkeeper

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

