Department of Design and Construction

PROJECT ID: **NC-61A**

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

VOLUME 1 OF 3

BID BOOKLET

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn, NY 11222**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

DEP

Quennell Rothschild & Partners

Date: **June 5, 2018**

*Revised on 11/19/2018

Bid Tab – REVISED*

Description	**RENOVATION OF THE NEWTOWN CREEK NATURE WALK, PHASE 3 - BOROUGH OF BROOKLYN**		
Bid Date	**10/04/2018**	**FMS ID**	**NC-61A**
Estimated Cost*	**$9,960,413.75***	**Client Agency**	**DEP**
Bid Security	**Not less than 2% of Total Bid Price**	**PLA** **PQL**	**YES** **NO**
Time Allowed	**720 CCD**	**Federal Funded:**	**NO**
Addendum	**3**	**Contract Manager**	**Nilofer Rajput**
PIN	**8502018CT0002C**	**Project Manager**	**Genaro De Jesus-Batista**
E-PIN	**85018B0124**	**Selective Bidding**	**☐Yes ☒No**

Bid Rank	Vendor	Bid Amount	Security Type
1	FRATELLO CONSTRUCTION CORP.	$9,600,000.00	Bond
2	PADILLA CONSTRUCTION SERVICES, INC	$17,971,066.00	Bond

SUBCONTRACTORS:

PLUMBING: Franco Belli Plumbing & Heating & Sons Inc. **$ 194,000.00**

ELECTRICAL: Hellman Electric Corp. **$ 553,000.00**

Recorder: Nishon Rivers, Ext. 3232 **Approver:** Lorraine Holley

Department of Design and Construction

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

November 20, 2018

CERTIFIED MAIL - RETURN RECEIPT REQUEST
FRATELLO CONSTRUCTION CORP.
134 MILBAR BOULEVARD
FARMINGDALE, NY 11735

RE: FMS ID: NC-61A
E-PIN: 85018B0124001
DDC PIN: 8502018CT0002C
RENOVATION OF THE NEWTOWN CREEK NATURE WALK, PHASE 3 - BOROUGH OF BROOKLYN
NOTICE OF AWARD

Dear Contractor:

You are hereby awarded the above referenced contract based upon your bid in the amount of $9,600,000.00 submitted at the bid opening on October 04, 2018. 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, 1st 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 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.

Sincerely,

Lorraine Holley

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.

SPECIAL NOTICE TO BIDDERS

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

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

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

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

PASSPort Disclosure Filing

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 will replace the paper-VENDEX process. In anticipation of awards, all bidders must create online accounts in the new PASSPort system, and file all disclosure information when the system becomes available. **Paper submissions, including certifications of no changes to existing VENDEX packages will not be accepted in lieu of complete online filings.**

Vendors that fall into any of the following categories are required to enroll:

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

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

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

PRE BID QUESTIONS (PBQs):

- **Please be advised that PBQs should be submitted to the Agency Contact Person at least five (5) business days (by 5:00 P.M. EST) prior to the bid opening date as indicated in ATTACHMENT 1 – BID INFORMATION, page 22, VOLUME 1 of 3 of this BID PACKAGE.**

BID BOOKLET
PART A

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PROJECT ID: NC-61A

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

BID BOOKLET

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

SPECIAL NOTICE TO BIDDERS

BID SUBMISSION REQUIREMENTS

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

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

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

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

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

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

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

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

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

NOTES:

(1) All of the above referred to blank forms to be completed and submitted with the bid are included in the BID BOOKLET.

(2) If the bidder has any questions or requires additional information, please contact the Department of Design and Construction by phone (718-391-2601) or by fax (718-391-2627).

(3) VENDEX QUESTIONNAIRES: Vendex Questionnaires, as well as detailed instructions, may be obtained at www.nyc.gov/vendex. The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.

(4) SPECIAL EXPERIENCE REQUIREMENTS: The Bidder is advised that Special Experience Requirements may apply to this contract. Such requirements are set forth on pages 3 and 4 of this Bid Booklet.

(5) SPECIAL EXPERIENCE REQUIREMENTS FOR ASBESTOS: The Bidder is advised that this contract contains strict requirements regarding the prior experience and licensing of the subcontractor who will perform any required asbestos abatement work. These special experience requirements are set forth in the section of the specifications which describes any required asbestos abatement work.

Special Notice to Bidders – Proprietary Items

A. General: A proprietary item required for the Project is specified below. The contractor is required to provide and install such proprietary item. The Contractor must provide the specified item from the designated manufacturer. Substitutions are not permissible and will not be approved. More detailed information regarding the item is set forth in the Specifications. Such information includes item description, as well as requirements for installation and related materials.

B. Payment: For the required proprietary item, an allowance amount is indicated. The allowance provides a stipulated amount to reimburse the Contractor for the purchase of the proprietary item from the designated manufacturer. Payment from the allowance shall be limited to the purchase price of the specified proprietary item and shall exclude any costs above and beyond the purchase price. Payment from the allowance shall not include any of the following costs with respect to the specified proprietary item: (1) any mark-up for the Contractor's overhead and profit, (2) any costs for transportation, including delivery, shipping or special handling costs, (3) any costs for installation, and (4) any costs for related materials. Payment for the specified proprietary item shall be based on the invoice actually provided by the manufacturer.

C. Bid Form: A total allowance amount for the purchase of all required proprietary items is set forth on the Bid Form. In preparing the lump sum portion of its bid, the Contractor shall:

(1) Exclude from its bid any costs for the purchase of the proprietary items, and

(2) Include in its bid any costs above and beyond the purchase price, including without limitation, costs for transportation, delivery, installation, related materials and overhead.

D. Required Proprietary Item(s):

CONTRACT NO. 1:

1. Proprietary Item: **STONE PAVING**
   - Type A: Granite Block Pavers at Fan Pattern (Royal Auburn)
   - Type B: Granite Pavers at Swale Trail Center Strip (Lake Placid Blue)
   - Type C: Granite Block Pavers at Swale Trail Edge Bands (Mountain Green)
   - Type D: Granite Bridge Ramps (Lake Superior Green)

   Specification Section: 32 14 20

   Manufacturer: Cold Spring Granite

   Allowance Amount: Not to Exceed $298,840

2. Proprietary Item: **STONE PAVING**
- Type H: Limestone Pavers at Tree Fossils (Irish Blue with stylolite fossils)

Specification Section: 32 14 20

Manufacturer: Irish Limestone Company

Allowance Amount: Not to Exceed $20,000

3. Proprietary Item: **STONE PAVING**
- Type I: Bluestone Flagstone Pavers (Bluestone)

Specification Section: 32 14 20

Manufacturer: New York Quarries Inc.

Allowance Amount: Not to Exceed $181,000

4. Proprietary Item: **STONEWORK**
- Wood & Stone Benches (Lake Superior Green)
- Stone Seating at Circular Shelter (Glacier Blue)
- Stone & Steel Tables & Benches (Mountain Green)
- Stone Drinking Fountain (Morton Gneiss/Rainbow Granite)

Specification Section: 32 40 10

Manufacturer: Cold Spring Granite

Allowance Amount: Not to Exceed $100,340

5. Proprietary Item: **STONEWORK**
- Linear Stone Benches (Chester Gray Granite)
- Linear Stone Boulders (Chester Gray Granite)

Specification Section: 32 40 10

Manufacturer: Williams Stone Co. Inc.

Allowance Amount: Not to Exceed $82,000

SPECIAL EXPERIENCE REQUIREMENTS

Special Experience Requirements apply as indicated below.

Bidder(s):	**General Construction Work**	**___X___ YES**	**_____ NO**
Specific Areas of Work:	**General Construction Work**	**___X___ YES**	**_____ NO**
	Electrical Work	**___X___ YES**	**_____ NO**
Manufacturer:	**General Construction Work**	**___X___ YES**	**_____ NO**

(A) **SPECIAL EXPERIENCE REQUIREMENTS FOR THE BIDDER IF APPLICABLE:** The special experience requirements set forth below apply to the bidder(s) indicated above. Compliance with such special experience requirements will be determined solely by the City prior to an award of contract. Failure to comply with the special experience requirements will result in the rejection of the bid as non-responsive.

- The bidder must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

(B) **QUALIFICATION FORM**: For each project submitted to demonstrate compliance with the special experience requirements, the bidder(s) indicated above must complete the Qualification Form included in the Bid Booklet. 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.

(C) **CONDITIONS**: The City may, in determining compliance with the special experience requirements set forth above, consider prior projects completed by principal(s) or other employees of the bidder while affiliated with another entity, subject to the conditions set forth below.

- Any principal or other employee on whose prior experience the bidder is relying to demonstrate compliance with this special experience requirement must have held the following: (a) a significant management role in the prior entity with which he/she was affiliated, and (b) a significant management role in the entity submitting the bid for a period of six months or from the inception of the bidding entity. If the bidder is relying on the prior experience of a principal or employee, it must submit documentation confirming the position held by such principal or employee in the prior entity, as well as in the bidding entity.

- The bidder may not rely on the experience of its principals or other employees to demonstrate compliance with any other requirements, including without limitation, financial requirements or requirements for a specified minimum amount of annual gross revenues.

(D) **JOINT VENTURES**: In the event the bidder is a joint venture, at least one firm in the joint venture must meet the above described experience requirements.

(E) **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 Work

- Section 033300: Architectural Concrete
- Section 051200: Structural Steel Framing
- Section 057000: Ornamental Stainless Steel Fences and Railing
- Section 310916: Driven Pile Load Tests
- Section 316216: Steel H-Piles
- Section 328400: Irrigation
- Section 329113: CU Structural Soil

Electrical Work

- Section 265000: Lighting

(2) Special experience requirements applicable to the contractor or subcontractor who will perform specific areas of work are summarized below. Such experience requirements are set forth in full in the Addendum to the General Conditions.

- The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. For Section 328400, the contractor or subcontractor performing the work must be a Certified Irrigation Contractor as qualified by the Irrigation Association.

(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. 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.

(F) **SPECIAL EXPERIENCE REQUIREMENTS FOR MANUFACTURER(S):** The special experience requirements set forth below apply to the manufacturer(s) that will supply or fabricate specific material or equipment. Compliance with such experience requirements will be evaluated after an award of contract. Within two (2) weeks of award, the contractor will be required to submit the qualifications of the proposed manufacturer(s). Once approved, no substitution will be permitted, unless the qualifications of the proposed replacement have been approved in writing in advance by the City.

(1) Special experience requirements apply to the manufacturer(s) of material and/or equipment specified in the section(s) set forth below.

General Construction

- Section 051200: Structural Steel Framing
- Section 057000: Ornamental Stainless Steel Fences and Railing

(2) Special experience requirements applicable to the manufacturer(s) of specified material or equipment are summarized below. Such experience requirements are set forth in full in the Addendum to the General Conditions.

- The manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years.

Qualification Form

Project ID: NC-61A

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: Fratello Construction Corp.

Name of Project: Queens Public Library, Children's Library Discovery Center

Location of Project: Jamaica, New York

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

Name: Patrick Moakley

Title: Project Manager Phone Number: 347-234-0258

Brief description of work completed: Partial renovation of existing Library & addition of new 21,000 sf LEED certified Dhildren's library. Scope demolition, abatement, foundations, piles, structural steel,underpinning, soil anchors, multiphased excavation, concrete, curbing, landscape, curtain wall, rain screen, roofing, library specialties & finishes

Was the work performed as a prime or a subcontractor: Prime

Amount of Contract: $ 12,000,000.00

Date of Completion: 2011

****

Name of Contractor: Fratello Construction Corp.

Name of Project: New Day Care Center at SUNY Farmingdale

Location of Project: Farmingdale, NY

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

Name: Lauri Selin

Title: Project Manager Phone Number: 518-320-1723

Brief description of work completed: Single prime construction develop 3 acre site on active campus, site utilities, earthwork, concrete, steel, cold formed metal framing, fiber cement siding,carpentry, finishes, playground equipment, mechanical, electrical, landscaping. New construction of 12,000 sf day care center with playground and recreation areas.

Was the work performed as a prime or a subcontractor: Prime

Amount of Contract: $ 6,000,000.00

Date of Completion: 2013

Qualification Form

Project ID: NC-61A

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: Fratello Construction Corp.

Name of Project: School Based Health Clinic at P.S. 18 for NYC SCA

Location of Project: Bronx, NY

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

Name: Nawras Soukar

Title: Project Manager Phone Number: 718-752-5738

Brief description of work completed: Single prime new addition of one story school health center, 4,000 sf. Abatement, demolition, concrete, masonry, steel, roofing, doors, windows, drywall & ceiling, flooring painting, plumbing, HVAC, electrical,piles, landscaping, earthwork & site utilities

Was the work performed as a prime or a subcontractor: Prime

Amount of Contract: $ 6,000,000.00

Date of Completion: 2016

****

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.

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NOTICE TO ALL PROSPECTIVE CONTRACTORS

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

ARTICLE I. M/WBE PROGRAM

Local Law No. 129 of 2005 added and Local Law 1 of 2013 amended Section 6-129 of the Administrative Code of the City of New York (hereinafter "Section 6-129"). Section 6-129 establishes the program for participation in City procurement ("M/WBE Program") by minority- owned business enterprises ("MBEs") and women-owned business enterprises ("WBEs"), certified in accordance with Section 1304 of the New York City Charter. As stated in Section 6¬-129, the intent of the program is to address the impact of discrimination on the City's procurement process, and to promote the public interest in avoiding fraud and favoritism in the procurement process, increasing competition for City business, and lowering contract costs. The contract provisions contained herein are pursuant to Section 6-129, and the rules of the Department of Small Business Services ("DSBS") promulgated thereunder.

If this Contract is subject to the M/WBE Program established by Section 6-129, the specific requirements of MBE and/or WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "M/WBE Utilization Plan"), and are detailed below. The Contractor must comply with all applicable MBE and WBE requirements for this Contract.

All provisions of Section 6-129 are hereby incorporated in the Contract by reference and all terms used herein that are not defined herein shall have the meanings given such terms in Section 6-129. Article I, Part A, below, sets forth provisions related to the participation goals for construction, standard and professional services contracts. Article I, Part B, below, sets forth miscellaneous provisions related to the M/WBE Program.

PART A

PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

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

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

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

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

A Contractor that is a qualified joint venture (as defined in Section 6-129(c)(30)) shall be permitted to count a percentage of its own participation toward fulfillment of the relevant **Participation Goal**. In accordance with Section 6-129, the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that Contractor pays to direct subcontractors, and then multiplying the remainder by the percentage to be applied to total profit to

determine the amount to which an MBE or WBE is entitled pursuant to the joint venture agreement. provided that where a participant in a joint venture is certified as both an MBE and a WBE, such amount shall be counted either toward the goal for MBEs or the goal for WBEs, but not both.

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

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

(ii) **Participation Goals** on a Master Services Agreement will be established for individual Task Orders issued after the Master Services Agreement is awarded. If **Participation Goals** have been established on a Task Order, a contractor shall be required to submit a Schedule B – M/WBE Utilization Plan For Independently Registered Task Orders That Are Issued Pursuant to Master Services Agreements, Part II (see Pages 2-4) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; and (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end. The contractor must engage in good faith efforts to meet the **Participation Goals** as established for the Task Order unless Agency has granted the contractor a pre-award waiver of the Participation Goals in accordance with Section 6-129 and Part A, Section 10 below.

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

5. Where an **M/WBE** Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multi¬year contracts, such list shall also be submitted every year thereafter. The Agency may also require the Contractor to report periodically about the contracts awarded by its direct subcontractors to indirect subcontractors (as defined in Section 6-129(c)(22)). **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or**

below $3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor must identify all those to which it intends to award construction subcontracts for any portion of the Wicks trade work at the time of bid submission, regardless of what point in the life of the contract such subcontracts will occur. In identifying intended subcontractors in the bid submission, bidders may satisfy any Participation Goals established for this Contract by proposing one or more subcontractors that are MBEs and/or WBEs for any portion of the Wicks trade work. In the event that the Contractor's selection of a subcontractor is disapproved. the Contractor shall have a reasonable time to propose alternate subcontractors.

6. MBE and WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the **Participation Goals**. Such certification must occur prior to the firms' commencement of work. A list of MBE and WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at 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, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

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

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

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

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

(b) To apply for a full or partial waiver of the **Participation Goals**, a bidder, proposer, or contractor, as applicable, must complete Part 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 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 #: 11-2992307

APT E-PIN#: 85018B0001

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 #	85018B0001	**FMS Project ID#:**	NC-61A
Project Title/Agency	Renovation of the Newtown Creek Nature Walk, Phase III		
PIN # Bid/Proposal	8502017CT0002C		
Response Date:	October 04, 2018		
Contracting Agency	Department of Design and Construction		
Agency Address	30-30 Thomson Avenue **City** Long Island City **State** NY **Zip Code** 11101		
Contact Person	Norma Liranzo **Title** MWBE Liaison & Compliance Analyst		
Telephone #	(718) 391-1502 **Email** negronn@ddc.nyc.gov		

Project Description *(attach additional pages if necessary)*

This Project consists of a garden area on a demapped street, including paved and planted areas, custom fabricated seating and shade structures, walls and fencing, water supply, irrigation drainage, electrical work and lighting.

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	
Unspecified *	**22**	%
or		
Black American	**Unspecified**	%
Hispanic American	**Unspecified**	%
Asian American	**Unspecified**	%
Women	**Unspecified**	%
Total Participation Goals	**22**	% **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 #: 11-2992307 APT E-

PIN#: 85018B0124

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 #	11-2992307	**FMS Vendor ID #**	V000017555
Business Name	Fratello Construction Corp.	**Contact Person**	Guilio Cianci
Address	134 Milbar Boulevard, Farmingdale, NY 11735		
Telephone #	631-414-7171	**Email**	info@fratelloconstruction.com

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

PRIME CONTRACTOR ADOPTING AGENCY M/WBE PARTICIPATION GOALS

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

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total Bid/Proposal Value		Agency Total Participation Goals (Line 1, Page 6)		Calculated M/WBE Participation Amount
9,600,000.	X	22%	=	2,112,000.
$				$ Line 2

PRIME CONTRACTOR OBTAINED PARTIAL WAIVER APPROVAL: ADOPTING MODIFIED M/WBE PARTICIPATION GOALS

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

Calculate the total dollar value of your total bid that you agree will be awarded to M/WBE subcontractors for services and/or credited to an M/WBE prime contractor or Qualified Joint Venture.

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation.

Total Bid/Proposal Value		Adjusted Participation Goal (From Partial Waiver)		Calculated M/WBE Participation Amount
	X		=	
$				$ Line 3

Tax ID #: 11-2992307 APT E-
PIN#: 85018B0124

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? % 60%

✓ Scopes of Subcontract Work

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

1. PILING	$350,000	MBE	12/2018 → 4/2019
2. PLUMBING	$ 19[illegible],000		1/2019 → [illegible]
3. ELECTRICAL	$ 575,000		12/2018 → 12/2020
4. LANDSCAPING	$ 300,000	MBE	3/2020 → 11/2020
5. STONEWORK	$ 200,000		12/2019 → 12/2020
6. STONE PAVERS	$ 450,000		12/2019 → 12/2020
7. STAINLESS STEEL FENCING	$ 250,000		12/2019 → 12/2020
8. STRUCTURAL STEEL	$ 500,000	MBE	6/2019 → 12/2019
9. CONCRETE	$ 700,000	MBE	4/2019 → 12/2019
10. PRECAST CONC. PANEL	$ 50,000		10/2019 → 11/2020
11. EXCAVATION & BF	$ 700,000		9/2018 → 12/2019
12. STORM DRAINAGE	$ 100,000		4/2019 → 12/2019
13. TRUCKING	$ 300,000	MBE	12/2018 → 12/2019
14.			
15.			
16.			
17.			

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 10/4/2018

Print Name Guilio Cianci 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.)

TYPE OF Contract _____ ENTITY _____ DATE COMPLETED _____

Manager at entity that hired vendor (Name/Phone No./Email) _____

Total Contract Amount $ _____ Total Amount Subcontracted $ _____

Type of Work Subcontracted _____ _____ _____

_____

TYPE OF Contract _____ AGENCY/ENTITY _____ DATE COMPLETED _____

Manager at agency/entity that hired vendor (Name/Phone No./Email) _____

Total Contract Amount $ _____ Total Amount Subcontracted $ _____

Item of Work Subcontracted and Value of subcontract _____ Item of Work Subcontracted and Value of subcontract _____ Item of Work Subcontracted and Value of subcontract _____

_____

TYPE OF Contract _____ AGENCY/ENTITY _____ DATE COMPLETED _____

Manager at entity that hired vendor (Name/Phone No./Email) _____

Total Contract Amount $ _____ Total Amount Subcontracted $ _____

Item of Work Subcontracted and Value of subcontract _____ Item of Work Subcontracted and Value of subcontract _____ Item of Work Subcontracted and Value of subcontract _____

_____

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

Signature: _____ **Date:** _____

Print Name: _____ **Title:** _____

Shaded area below is for agency completion only

AGENCY CHIEF CONTRACTING OFFICER APPROVAL

Signature: _____ Date: _____

CITY CHIEF PROCUREMENT OFFICER APPROVAL

Signature: _____ Date: _____

Waiver Determination

Full Waiver Approved: ☐
Waiver Denied: ☐
Partial Waiver Approved: ☐
Revised Participation Goal: ____%

#1

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: NC-61A

Renovation of the Newtown Creek Nature Walk, Phase III
329 Greenpoint Avenue
Brooklyn, NY 11222

Name of Bidder: Fratello Construction Corp.

Date of Bid Opening: October 4, 2018

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

Place of Business of Bidder: 134 Milbar Boulevard, Farmingdale, NY 11735

Bidder's Telephone Number: 631-414-7171 Bidder's Fax Number: 631-414-7170

Bidder's Email Address: info@fratelloconstruction.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 York

Name and Home Address of President: Stephen Bono
2 The Spout, Smithtown, NY

Name and Home Address of Secretary: Guilio Cianci
14 Tideway Lane, East Northport, NY

Name and Home Address of Treasurer:

BID FORM

The above-named Bidder affirms and declares:

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

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

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

4. The bidder is not in arrears to the City of New York upon debt or contract or taxes, and is not a defaulter, as surety or otherwise, upon any obligation of the CIty of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York or State of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except as set forth on the Affirmation included as page 17 of this Bid Booklet.

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

5. The bidder, as an individual, or as a member, partner, director or officer of the bidder, if the same be a firm, partnership or corporation, executes this document expressly warranting and representing that should this bid be accepted by the City and the Contract awarded to him, he and his subcontractors engaged in the performance: (1) will comply with the provisions of Section 6-108 of the Administrative Code of the City of New York and the non-discrimination provisions of Section 220a of the New York State Labor Law, as more expressly and in detail set forth in the Agreement; (2) will comply with Section 6-109 of the Administrative Code of the City of New York in relation to minimum wages and other stipulations as more expressly and in detail set forth in the Agreement; (3) have complied with the provisions of the aforesaid laws since their respective effective dates, and (4) will post notices to be furnished by the City, setting forth the requirements of the aforesaid laws in prominent and conspicuous places in each and every plant, factory, building and structure where employees engaged in the performance of the Contract can readily view it, and will continue to keep such notices posted until the supplies, materials and equipment, or work labor and services required to be furnished or rendered by the Contractor have been finally accepted by the City. In the event of any breach or violation of the foregoing, the Contractor may be subject to damages, liquidated or otherwise, cancellation of the Contract and suspension as a bidder for a period of three years. (The words, "the bidder", "he", "his", and "him" where used shall mean the individual bidder, firm, partnership or corporation executing this bid).

6. Compliance Report

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

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

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

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

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

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

Section V: Vendor Certification and Required Affirmations:

I hereby:

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

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

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

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

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

BID FORM

PROJECT ID: NC-61A

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

A. LUMP SUM PRICE - Total price for all labor and material for all required work, excluding items (B), (C) and (D) set forth below. Total Price shall include all costs and expenses, i.e., labor 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		
$ 5,210,000.	+	$ 3,473,896.	Total Price for Item A=	$8,683,896.

B. ALLOWANCE for Incidental Asbestos Abatement (Section 028013 of the Specifications) — **$15,000.00**

C. AMOUNT for Proprietary Items (pages 2a) — **$682,180.00**

D. AMOUNT for Unit Prices (from page 13-0) for extra work items — $ 218,924

TOTAL BID PRICE (Add A + B + C + D) (a/k/a BID PROPOSAL) — $9,600,000.

HR
10/4/18

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".** X Yes _____ No

Bidder: Fratello Construction Corp.

By: _____
Guilio Cianci, Vice President/Secretary (Signature of Partner or corporate officer)

_____
Attest: Guilio Cianci Secretary of Corporate Bidder
(Corporate Seal)

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

Unit Price Schedule

FMS ID: **NC-61A**

Unit Price items: The items of work set forth in the Schedule below shall be performed by the contractor on a unit price basis for additional work. Such items of work shall be performed by the contractor only as directed in writing by the Commissioner.

The unit price for the items of work in the Schedule below are for EXTRA WORK ONLY i.e., work which is above and beyond that described in the Drawings and Specifications.

The bidder shall submit prices for all the items of work in the Schedule below. The bidder shall insert the total sum for all unit price items on the Bid Form, Item D - Amount for Unit Prices. The unit price bid for each item shall include all costs and expense for the item, i.e., labor, material, overhead and profit. Quantities shown are approximate and for bid comparison purposes only. Actual amounts to be determined when the work is performed.

CSI #	Item #	Item Description	Quant	Units	Unit Price	Total
31 2316	1	Soils for earthwork, common borrow, spread with 200 H.P. dozer, includes load at pit and haul, 2 miles round trip, excludes compaction	260	CY	95	24,700.
31 2316	2	Soils for earthwork, borrow, spread with 200 HP dozer, includes load at pit and haul, round trip, excludes compaction for 5 mile haul	260	CY	95	24,700.
31 2316	3	Excavating, bulk bank measure, 1 C.Y. capacity = 75 C.Y./hour, backhoe, hydraulic, crawler mounted, excluding truck loading	315	CY	35	11,025.
31 2316	4	Hauling of excavated soil, 8 cy truck	57	Load	675	38,475.
31 2316	5	Disposal of Contaminated Material	452	CY	51	23,052.
31 2323	6	Backfill, Select Fill	164	CY	60	9,840.
31 2323	7	Backfill, place Structural and Planting Soils, 50' Haul	146	CY	100	14,600.
31 2323	8	Backfill, place Sturctural and Planting Soils, 150' haul, includes compaction	146	CY	125	18,250.
31 6216	10	Sheet steel piles, "H" Sections, 85' long, HP12 x 53, excludes mobilization or demobilization	459	VLF	98	44,982.
31 6216	11	Pile joint splice	6	EA	1,300	7,800.
31 6216	12	Piling special costs, cutoffs, steel pile or "H" pile	6	EA	250	1,500.

Total Amount of Unit Price Work
* Insert Total amount of Unit Price Work on line D of Bid Form
Note: All quantities are approximate

$218,924.

BID FORM (TO BE NOTARIZED)

****

AFFIDAVIT WHERE BIDDERS IS AN INDIVIDUAL

STATE OF NEW YORK, COUNTY OF _____ ss:

_____ being duly sworn says:

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

_____

(Signature of the person who signed the Bid)

Subscribed and sworn to before me this

____ day of _____,

_____

Notary Public

****

AFFIDAVIT WHERE BIDDERS IS A PARTNERSHIP

STATE OF NEW YORK, COUNTY OF _____ ss:

_____ being duly sworn says:

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

_____

(Signature of Partner who signed the Bid)

Subscribed and sworn to before me this

____ day of _____,

_____

Notary Public

****

AFFIDAVIT WHERE BIDDERS IS A CORPORATION

STATE OF NEW YORK, COUNTY OF Nassau ss:

Guilio Cianci being duly sworn says:

I am the Vice President/Secretary of the above named corporation whose name is subscribed to and which executed the foregoing bid. I reside at 14 Tideway Lane, East Northport, NY.

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

Guilio Cianci

(Signature of Corporate Officer who signed the Bid)

Subscribed and sworn to before me this

4th day of October, 2018

Joan M. Knoblach

Notary Public

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

AFFIRMATION

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

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

Full Name of Bidder: Fratello Construction Corp.
Address: 134 Milbar Boulevard
City: Farmingdale State: New York Zip Code: 11735

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

[X] C - Corporation
EMPLOYER IDENTIFICATION NUMBER

11-2992307

By: _____
Signature: Guillo Cianci

Title: Vice President/Secretary

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 submiited 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 Plaan), 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: NC-61A

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:** FRANCO BELLI PLUMBING & HEATING & SONS, INC (Print Name)

   Description of Plumbing Work: PLUMBING, WATER LINE

   Agreed amont to be paid Subcontractor: $ 194,000.✓

2. **ELECTRICAL CONTRACTOR:** HELLMAN ELECTRIC CORP. (Print Name)

   Description of Electrical Work: ELECTRICAL, LIGHT FIXTURES.

   Agreed amont to be paid Subcontractor: $ 553,000.✓

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

Guilio Cianci

(Bidder's Signature) (Print Name)

134 Milbar Boulevard, Farmingdale, NY 11735

(Address)

Vice President/Secretary	631-414-7171	631-414-7170	10/4/2018
(Title)	(Phone #)	(Fax#)	(Date)

BID BOND 1
FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS. That we, Fratello Construction Corp.

134 Milbar Blvd., Farmingdale, NY 11735

hereinafter referred to as the "Principal", and Hartford Fire Insurance Company
One Hartford Plaza
Hartford, CT 06155-0001

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

Renovation of the Newtown Creek Nature Walk, Phase III- Contract #1-General Construction

Work, Project ID# NC-61A, DDC #8502018CT0002C, Brooklyn, NY

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 the time within which the City may accept the Principal's Proposal, or by any waiver by the City of any of the requirements of the Information for Bidders, and the Surety hereby waives notice of any such postponements, extensions, or waivers.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the 27th day of September, 2018.

(Seal)

Fratello Construction Corp. (L.S.)
Principal

By: _____
Guilio Cianci, Vice President

(Seal)

Hartford Fire Insurance Company
Surety

By: _____
Deborah L. Severin, Attorney-in-Fact

BID BOND 3

ACKNOWLEDGMENT OF PRINCIPAL. IF A CORPORATION

State of New York County of Nassau ss:
On this 27th day of September, 2018, before me personally came
Guilio Cianci to me known, who, being by me duly sworn, did depose and say
that he resides at 14 Tideway Lane, East Northport, NY
that he is the Vice President of Fratello Construction Corp.
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.

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

Joan M. Knoblach
Notary Public

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:
On this _____ day of _____, _____, before me personally appeared
_____ to me known and known to me to be one of the members of the
firm of _____ described in and who executed the foregoing instrument, and he acknowledged to me that he executed the same as and for the act and deed of said firm.

_____
Notary Public

ACKNOWLEDGMENT OF PRINCIPAL. IF AN INDIVIDUAL

State of _____ County of _____ ss:
On this _____ day of _____, _____, before me personally appeared
_____ to me known and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

_____
Notary Public

ACKNOWLEDGMENTS AND JUSTIFICATION OF SURETIES

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK }
COUNTY OF NASSAU } ss:

On September 27, 2018 before me personally came Deborah L. Severin to me known who, being by me duly sworn, did depose and say that he/she resides at 255 Executive Drive, Plainview, New York 11803, that he/she is the Attorney-In-Fact of Hartford Fire Insurance Company the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name thereto by order of the Board of Directors of said corporation.

ROSANNE CALLAHAN
Notary Public, State of New York
No. 01CA6024444
Qualified in SUFFOLK County
Commission Expires May 10, 20 19

Notary Public

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-12
One Hartford Plaza
Hartford, Connecticut 06155
Bond.Claims@thehartford.com
call: **888-266-3488** *or fax:* **860-757-5835**

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Agency Name: SGH ASSOCIATES INC
Agency Code: 12-128095

- [X] **Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [X] **Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of*** Unlimited :

Janice Fiscina, Rosanne Callahan, Robert Finnell, Peter Henry, Jennifer Johnston, Fern Perry, Deborah L. Severin of PLAINVIEW, New York

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on May 6, 2015 the Companies have caused these presents to be signed by its Senior Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

John Gray, Assistant Secretary

M. Ross Fisher, Senior Vice President

STATE OF CONNECTICUT }
COUNTY OF HARTFORD } ss. Hartford

On this 5th day of January, 2018, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Senior Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

Kathleen T. Maynard
Notary Public
Commission Expires July 31, 2021

CERTIFICATE

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of

SEP 27 2018

Signed and sealed at the City of Hartford.

Kevin Heckman, Assistant Vice President

HARTFORD FIRE INSURANCE COMPANY

Hartford, Connecticut

Financial Statement, June 30, 2017

Statutory Basis

ASSETS

U.S. Government Bonds	$	607,225,948
Bonds of Other Governments		134,069,801
State, County Municipal		
Miscellaneous Bonds		5,782,757,431
Stocks		5,976,423,366
Short Term Investments		462,290,574
	$	12,962,767,120
Real Estate	$	335,148,217
Cash		45,564,542
Agents' Balances (Under 90 Day)		3,037,980,240
Other Invested Assets		6,431,049,108
Miscellaneous		2,996,427,081
Total Admitted Assets	$	25,808,936,308

LIABILITIES

Reserve for Claims and Claim Expense		$	7,905,274,972
Reserve for Unearned Premiums			2,154,900,357
Reserve for Taxes, License and Fees			61,378,282
Miscellaneous Liabilities			2,880,489,103
Total Liabilities		$	13,002,042,714
Capital Paid In	$ 55,320,000		
Surplus	12,751,573,594		
Surplus as regards Policyholders		$	12,806,893,594
Total Liabilities, Capital and Surplus		$	25,808,936,308

STATE OF CONNECTICUT
COUNTY OF HARTFORD } SS.
CITY OF HARTFORD

Michael R. Hazel, Vice President and Controller, and Allen R. Craig, Assistant Secretary of the Hartford Fire Insurance Company, being duly sworn, each deposes and say that the foregoing is a true and correct statement of the said company's financial condition as of June 30, 2017.

Subscribed and sworn to before me
this 19th day of September, 2017

Vice President and Controller

Notary Public

Assistant Secretary

JOANNE V FARRELL
Notary Public, State of Connecticut
My Commission Expires Dec. 31, 2020

Form CS-19-37 HF printed in U.S.A.

BID BREAKDOWN

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

X	YES		NO

Limitations on Use of Bid Breakdown:

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

Instructions for Preparing Bid Breakdown:

(A) The Bid Breakdown is set forth on the following pages of this Bid Booklet and is in accordance with the Construction Specification Institute (CSI) format. For all items of work listed in the Bid Breakdown, the bidder must indicate the price for labor and the price for material, as well as the estimated quantities required.

(B) In preparing its Bid Breakdown, the bidder shall submit prices that include all costs for overhead and profit. Overhead shall include, without limitation, all costs in connection with the following: administration, management, superintendence, small tools, insurance, bonds, and provision of services or items required by the General Conditions [except for Security/Fire Guard Services and Temporary Heat]. If the Project requires Security/Fire Guard Services and/or Temporary Heat, such service(s) will be included as separate line items in the Bid Breakdown.

(C) If an item is set forth in the Bid Breakdown, but is not included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to leave the item blank and exclude the cost of the item from its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items left blank.

(D) If an item is not set forth in the Bid Breakdown, but is included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to add the item to its Bid Breakdown and include the cost of the item in its grand total. In an attachment to its Bid Breakdown, the bidder shall provide a list of all items added.

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Department of Design and Construction, Farmingdale, New York 11735

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	CONTRACT 1 - GENERAL CONSTRUCTION WORK							
01 0000	GENERAL REQUIREMENTS							
01 0000	GENERAL REQUIREMENTS							
	Temporary Power/ Lighting	1	ls					
	Security Guards	1	ls					
	Mobilization	1	ls					
	Subtotal							1,216,896.
01 4550	LEAKAGE TESTS							
	Pipe testing, nondestructive hydraulic pressure test, isolate, 1 hour hold, 6" to 10" pipe, 250 - 500 L.F.	1	ea					
	Pipe testing, nondestructive hydraulic pressure test, isolate, 1 hour hold, 1" to 4" pipe, 250 - 500 L.F	1	ea					
	Subtotal							2,000.
02 0000	EXISTING CONDITIONS							
02 4100	DEMOLITION							
	Selective Demolition, Pavement and Curb							
	Demolish, remove pavement & curb, remove bituminous pavement, 4" to 6" thick, excludes hauling and disposal fees	3309	sy					
	Selective Demolition, Water & Sewer Piping and Fittings Selective demolition, water & sewer piping & fittings, concrete pipe, 4"-10", diameter, excludes excavation	590	lf					
	Selective Demolition, Manholes & Catch Basins							
	Selective demolition, manholes & catch basins, manhole or catch basin, precast or brick, over 8' deep, excludes excavation	24	vlf					
	Selective Demolition, Chain Link Fences & Gates							
	Selective demolition, chain link fences & gates, fence, 8' high	910	lf					
	Remove Jersey Barrier at Fence	242	lf					

Department of Design and Construction

134 [illegible] Farmingdale, New York 1173[illegible]

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Minor Site Demolition							
	Minor site demolition, hydrants, fire, remove only, excludes hauling	2	ea					
	Structure Demolition							
	Building Demolition Footings and Foundations							
	Bldg. footings and foundations demolition, remove concrete walls, plain concrete, 12" thick, excludes disposal costs and dump fees	110	sf					
	Electrical Demolition							
	Metal light pole, 40' high, electrical demolition, remove	1	ea					
	Selective Structure Demolition							
	Selective Demolition, Saw Cutting							
	Selective demolition, saw cutting, asphalt, up to 3" deep	500	lf					
	Selective demolition, saw cutting, each additional inch of depth over 3"	1500	lf					
	Subtotal							273,000
03 0000	CONCRETE							
03 3000	CAST-IN-PLACE CONCRETE							
	Basic Concrete Materials							
	Concrete Admixtures and Surface Treatments							
	Concrete surface treatment, bonding agent, epoxy resin, 80 S.F. per gallon, 3.5 gallon unit, includes material only		gal					
	Bonding agent, applying		sf					
	Concrete, roughen		sf					
	Structural Cast-in-Place Concrete Forming							
	Forms in Place, Beams and Girders							
	C.I.P. concrete forms, beams, sides only, vertical, plywood, 36" high, 1 use, includes shoring, erecting, bracing, stripping and cleaning		sfca					
	Forms in Place, Columns							

Department of Design and Construction

1341 Farmingdale, New York 1173

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	C.I.P. concrete forms, column, round fiber tube, recycled paper, 12" diameter, 1 use, includes erecting, bracing and stripping		lf					
	C.I.P. concrete forms, column, round fiber tube, recycled paper, 16" diameter, 1 use, includes erecting, bracing and stripping		lf					
	C.I.P. concrete forms, column, round fiber tube, recycled paper, 18" diameter, 1 use, includes erecting, bracing and stripping		lf					
	C.I.P. concrete forms, column, round fiber tube, recycled paper, 26" diameter, 1 use, includes erecting, bracing and stripping		lf					
	Forms in Place, Elevated Slabs							
	C.I.P. concrete forms, elevated slab, flat plate, plywood, to 15' high, 1 use, includes shoring, erecting, bracing, stripping and cleaning		sf					
	C.I.P. concrete forms, elevated slab, curb forms, wood, 6" to 12" high, 2 use, includes shoring, erecting, bracing, stripping and cleaning		sf					
	C.I.P. concrete forms, elevated slab, edge forms, 7" to 12" high, 1 use, includes shoring, erecting, bracing, stripping and cleaning		sfca					
	Forms in Place, Equipment Foundations							
	C.I.P. concrete forms, equipment foundations, 1 use, includes erecting, bracing, stripping and cleaning		sf					
	Forms in Place, Footings							
	C.I.P. concrete forms, footing, continuous wall, plywood, 1 use, includes erecting, bracing, stripping and cleaning		sf					
	C.I.P. concrete forms, pile cap, square or rectangular, plywood, 1 use, includes erecting, bracing, stripping and cleaning		sf					
	C.I.P. concrete forms, footing, spread, plywood, 1 use, includes erecting, bracing, stripping and cleaning		sf					
	Forms in Place, Grade Beam							
	C.I.P. concrete forms, grade beam, plywood, 1 use, includes		sf					
	Forms in Place, Mat Foundation							
	C.I.P. concrete forms, mat foundation, plywood, 1 use, includes		sf					

Department of Design and Construction

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Forms in Place, Slab On Grade							
	C.I.P. concrete forms, slab on grade, curb, wood, 6" to 12" high, 2 use, includes erecting, bracing, stripping and cleaning		sf					
	Forms in Place, Walls							
	C.I.P. concrete forms, wall, wood bulkhead with 2 piece keyway, 1 use, includes erecting, bracing, stripping and cleaning		lf					
	C.I.P. concrete forms, wall, job built, plywood, to 8' high, 1 use, includes erecting, bracing, stripping and cleaning		sfca					
	C.I.P. concrete forms, wall, job built, plywood, over 8' to 16' high, 1 use, includes erecting, bracing, stripping and cleaning		sfca					
	C.I.P. concrete forms, pilasters/piers, plywood, 1 use, includes erecting, bracing, stripping and cleaning		sf					
	Waterstops							
	Waterstop, PVC, dumbbell type, 3/16" thick x 6" wide		lf					
	Reinforcing Steel Accessories							
	Rebar Accessories							
	Slab bolsters, for reinforcing steel, continuous (SB), plain steel, 1" high, includes material only		clf					
	Bar chair (BC), for reinforcing steel, plain steel, 1-1/2" high, includes material only		c					
	Uncoated Reinforcing Steel							
	Reinforcing In Place							
	Reinforcing Steel, in place, beams and girders, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		lb					
	Reinforcing Steel, in place, beams and girders, #8 to #18, A615, grade 60, incl labor for accessories, excl material for accessories		lb					
	Reinforcing Steel, in place, columns, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		lb					

Department of Design and Construction

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Farmingdale, New York 117...

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Reinforcing Steel, in place, elevated slabs, #4 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		lb					
	Reinforcing Steel, in place, footings, #4 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		ton					
	Reinforcing Steel, in place, footings, #8 to #18, A615, grade 60, incl labor for accessories, excl material for accessories		ton					
	Reinforcing Steel, in place, slab on grade, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		ton					
	Reinforcing Steel, in place, walls, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories		ton					
	Reinforcing steel, in place, dowels, deformed, 2' long, #4, A615, grade 60		ea					
	Reinforcing steel, in place, dowels, deformed, 2' long, #5, A615, grade 60		ea					
	Uncoated Welded Wire Fabric							
	Welded Wire Fabric							
	Welded wire fabric, sheets, 6 x 6 - W2.9 x W2.9 (6 x 6) 42 lb. per C.S.F., A185		csf					
	Subtotal							610,000
03 3300	**ARCHITECTURAL CONCRETE**							
	Normal Weight Structural Concrete							
	Normal Weight Concrete, Ready Mix							
	Struct concrete,ready mix,normal wt,5000 psi,includes local aggregate,sand,portland cement and water,delivered,excludes all additives and treatments	802	cy					
	Placing Concrete							
	Structural concrete, placing, beam, large, pumped, includes strike off & consolidation, excludes material		cy					

Department of Design and Construction

134 I..
Farmingdale, New York 11735

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Structural concrete, placing, column, square or round, pumped, 12" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, column, square or round, pumped, 24" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, column, square or round, pumped, 36" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, elevated slab, pumped, over 10" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, continuous footing, shallow, direct chute, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, spread footing, direct chute, over 5 C.Y., includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, spread footing, pumped, over 5 C.Y., includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, grade beam, direct chute, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, pile caps, direct chute, 5 C.Y. to 10 C.Y., includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, slab on grade, pumped, up to 6" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, slab on grade, direct chute, over 6" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, slab on grade, pumped, over 6" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, walls, pumped, 12" thick, includes strike off & consolidation, excludes material		cy					
	Structural concrete, placing, walls, pumped, 15" thick, includes strike off & consolidation, excludes material		cy					
	Tooled Concrete Finishing							
	Finishing Floors							

Department of Design and Construction

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Concrete finishing, floors, basic finishing for unspecified flatwork, bull float only, excludes placing, striking off & consolidating		sf					
	Concrete finishng,floors,basic finishng for unspecfd flatwork,bull float,manual float&manual steel trowel,excludes placing,striking off & consolidating		sf					
	Concrete finishing, floor, exposed local aggregate finish, minimum		sf					
	Finishing Walls							
	Concrete finishing, walls, includes breaking ties and patching voids		sf					
	Concrete finishing, walls, burlap rub with grout, includes breaking ties and patching voids		sf					
	Concrete finishing, wall, exposed aggregate finish		sf					
	Moon Boot and Foot Imprints, etc.		ls					
	Tilt-Up Concrete							
	Tilt-Up Wall Panels							
	Tilt-up wall panel, wall only, 7-1/2" thick	285	sf					
	Track Mounted Concrete Wall Sawing							
	Concrete Wall Cutting							
	Concrete sawing, concrete walls, rod reinforcing, per inch of depth, 12"tk		lf					
	Concrete Drilling							
	Concrete Impact Drilling							
	Concrete impact drilling, for dowels, in concrete floors, includes bit & layout, up to 4" deep		ea					
	Concrete impact drilling, for dowels, in concrete floors, for each additional inch over 4" deep, add		ea					
	Subtotal							520,000.

Department of Design and Construction

Fratello Construction Corp.
134 Main Boulevard
Farmingdale, New York 11735

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
03 4500	PRECAST ARCHITECTURAL CONCRETE							
	Cast Stone Masonry Features							
	Coping							
	Precast concrete coping, stock units, 14" wall, 16" wide, 4" tapers to 3-1/2", includes mortar, excludes scaffolding	425	lf					
	Subtotal							65,000.-
05 0000	METALS							
05 0810	GALVANIZING							
	Shop-Applied Coatings for Metal							
	Paints and Protective Coatings							
	Paints and protective coatings, galvanizing structural steel in shop, 1 ton to 20 tons, hot dip	10	ton					
	Subtotal							24,000.-
05 1200	STRUCTURAL STEEL FRAMING							
	Metal Fastenings							
	Bolts & Hex Nuts							
	Bolt, hex head, plain steel, 3/4" dia x 4" L, A307, incl nut & washer	40	ea					
	Vibration & Bearing Pads							
	Bearing pad, neoprene, 3/8" T	20	sf					
	Structural Steel for Buildings							
	Columns, Structural							
	Column, structural, galvanized, 6" dia x 6'-9" H	8	ea					
	Column, structural, galvanized, 24" dia x 14'-6" H, sch 40, inc weld studs at 18" c-c vertically	1	ea					
	Column, structural tubing, galvanized, 10"x10"x1/2"x3'-0"	8	ea					
	Ring beam, structural tubing, rectangular, 6"x2"x1/4", incl shop fabricated circular	887	lb					
	Curb Edging							

Department of Design and Construction

Fratello [illegible] Corp.
134 [illegible]
Farmingdale, New York 1173[illegible]

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Curb, steel facing	117	lf					
	Lightweight Framing							
	Angle framing, structural steel, galvanized, cap angle, 3"x2"x1/4"	100	lf					
	Bar tee framing, structural steel, rafter, galvanized, WT3"x12.5	208	lf					
	Subtotal							417,000.
05 5000	**METAL FABRICATIONS**							
	Plates							
	Steel plate, structural, galvanized, for stiffeners, 1/4" T, shop fabricated	50	sf					
	Steel plate, structural, galvanized, for roof, 5/16" T, shop fabricated	444	sf					
	Steel plate, structural, galvanized, for ring plate, 5/16" T, shop fabricated circular	660	sf					
	Steel plate, structural, galvanized, for column top plate, 1/2" T, shop fabricated	17	sf					
	Steel plate, structural, galvanized, for column base plate, 1" T, shop fabricated	17	sf					
	Structural Steel Projects							
	Boat shelter, shop fabricated and delivered	1	ea					
	Install boat shelter support columns, labor only	1	ea					
	Install boat shelter, labor only	1	ea					
	Bench with shade roof, shop fabricated, delivered and installed	6	ea					
	Floor Plates							
	Checkered Plates							
	Floor plate, steel checkered plate, rectangular, 1/4" T	200	lb					
	Subtotal							317,000.

Department of Design and Construction

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Farmingdale, New York 1173

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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 5600	**METAL CASTINGS**							
	Utilty area drains,catch basins manhls frames and covers,raised for paving,4 piece expnsn ring,1-1/4"- 2"high,20"26",excids footng,excavation and backfill	7	ea					
	Subtotal							6,000.-
05 7000	**ORNAMENTAL STAINLESS STEEL FENCES AND RAILING**							
	Pipe and Tube Railings							
	Railings, Pipe							
	Railing, shiprailing, stainless steel, 4" dia top rail, 3"x3/4" flat bar, 9 - 3/4" dia. rods, shop fabricated	56	lf					
	Subtotal							55,000.-
07 0000	**THERMAL AND MOISTURE PROTECTION**							
07 9200	**JOINT SEALANTS**	1	ls					
	Subtotal							6,000.-
22 0000	**PLUMBING**							
22 1000	**PLUMBING PIPING AND VALVES**							
	Plumbing Demolition							
	Pipe, metal pipe, 2" to 3-1/2" diam., selective demolition	170	lf					
	Pipe, metal pipe, 4" to 6" diam., selective demolition	0	lf					
	Pipe, metal pipe, 8" to 14" diam., selective demolition	420	lf					
	Facility Water Distribution Piping							
	Pipe/Tube, Copper							
	Pipe, copper, tubing, solder, 3/4" diameter, type K, includes coupling	65	lf					
	Pipe, copper, tubing, solder, 1" diameter, type K, includes coupling	105	lf					

Department of Design and Construction

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CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Pipe, copper, tubing, solder, 1-1/2" diameter, type K, includes coupling	116	lf					
	Pipe, copper, tubing, solder, 3" diameter, type K, includes coupling	60	lf					
	Pipe/Tube Fittings, Copper							
	Elbow, 90 Deg., copper, wrought, copper x copper, 3/4"	2	ea					
	Elbow, 90 Deg., copper, wrought, copper x copper, 1"	2	ea					
	Elbow, 90 Deg., copper, wrought, copper x copper, 3"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the outlet, 1"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the outlet, 1-1/2"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the outlet, 3"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the run, 1"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the run, 1-1/2"	2	ea					
	Tee, copper, wrought, copper x copper, reducing on the run, 3"	2	ea					
	Pipe Fittings, Steel							
	Cap, steel, carbon steel, black, butt weld, standard weight, 6" pipe size, includes 1 weld per joint and weld machine	1	ea					
	Drinking Water Fountains							
	Drinking fountain,floor mounted,pedestal type,precast stone/concrete,cylindrical col style,wheelchair handicap unit,for connection cold water supply	4	ea					
	Subtotal							141,000
26 0000	**ELECTRICAL**							
26 0500	**GENERAL ELECTRICAL REQUIREMENTS**							
	General Electrical Requirements	1	ls					
	Subtotal							46,000

Department of Design and Construction

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
26 0519	**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**							
	Cable Terminations							
	Crimp 1 hole lugs, copper or aluminum, 600 volt, #12	330	ea					
	Crimp 1 hole lugs, copper or aluminum, 600 volt, #10	8	ea					
	Crimp 1 hole lugs, copper or aluminum, 600 volt, #8	2	ea					
	Crimp 1 hole lugs, copper or aluminum, 600 volt, #4	6	ea					
	Wire							
	Pullstring for spare conduits	600	clf					
	Wire, copper, stranded, 600 volt, #12, type XLPE-USE(RHW), in raceway	9300	clf					
	Wire, copper, stranded, 600 volt, #10, type XLPE-USE(RHW), in raceway	520	clf					
	Wire, copper, stranded, 600 volt, #8, type XLPE-USE(RHW), in raceway	120	clf					
	Wire, copper, stranded, 600 volt, #4, type XLPE-USE(RHW), in raceway	720	clf					
	Subtotal							60,000.
26 0526	**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**							
	Grounding rod, copper clad, 10' long, 1" diameter	1	ea					
	Exothermic weld, #8 wire to ground rod	1	ea					
	Insulated ground wire, copper, #8	1	clf					
	Ground test well	1	ea					
	Subtotal							5,000.
26 0529	**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**							
	Hangers & Supports	1	ls					
	Subtotal							16,000.

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
26 0533	**RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**							
	Conduit							
	Rigid galvanized steel conduit elbows, 1" diameter, to 15' high	118	ea					
	Rigid galvanized steel conduit elbows, 2" diameter, to 15' high	10	ea					
	Rigid galvanized steel conduit couplings, 1" diameter, to 15' high		ea					
	Rigid galvanized steel conduit couplings, 2" diameter, to 15' high	10	ea					
	Rigid galvanized steel plastic coated conduit, 40 mil. thick, 3/4" diameter, to 15' high	1	lf					
	Rigid galvanized steel plastic coated conduit, 40 mil. thick, 1" diameter, to 15' high	1	lf					
	Rigid galvanized steel plastic coated conduit, 40 mil. thick, 1-1/2" diameter, to 15' high	1	lf					
	Rigid galvanized steel plastic coated conduit elbows, 3/4" diameter, to 15' high	1	ea					
	Rigid galvanized steel plastic coated conduit elbows, 1" diameter, to 15' high	1	ea					
	Rigid galvanized steel plastic coated conduit elbows, 1-1/2" diameter, to 15' high	1	ea					
	Rigid galvanized steel plastic coated conduit couplings, 3/4" diameter, to 15' high	1	ea					
	Rigid galvanized steel plastic coated conduit couplings, 1" diameter, to 15' high	1	ea					
	Rigid galvanized steel plastic coated conduit couplings, 1-1/2" diameter, to 15' high	1	ea					
	PVC conduit, schedule 40, 3/4" diameter, to 15' H, incl terminations, fittings, & support	1	lf					
	PVC conduit, schedule 40, 1" diameter, to 15' H, incl terminations, fittings, & support	1	lf					
	PVC conduit elbows, 3/4" diameter, to 15' H	1	ea					
	PVC conduit elbows, 1" diameter, to 15' H	1	ea					
	PVC conduit elbows, 1-1/2" diameter, to 15' H	1	ea					

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
	PVC-tee fitting & cover, 3/4" diameter, to 15' H	1	ea					
	PVC-tee fitting & cover, 1" diameter, to 15' H	1	ea					
	Rigid galvanized steel conduit, 1" diameter, to 15' high, incl couplings only	3660	lf					
	Rigid galvanized steel conduit, 2" diameter, to 15' high, incl couplings only	720	lf					
	Conduit Fittings for Rigid Galvanized Steel							
	Conduit fittings for rigid galvanized steel, sealing locknuts, 3/4" diameter	1	ea					
	Conduit fittings for rigid galvanized steel, sealing locknuts, 1" diameter	118	ea					
	Conduit fittings for rigid galvanized steel, sealing locknuts, 1-1/2" diameter	1	ea					
	Conduit fittings for rigid galvanized steel, sealing locknuts, 2" diameter	10	ea					
	Conduit fittings for rigid galvanized steel, grounding bushing, insulated, 3/4" diameter	1	ea					
	Conduit fittings for rigid galvanized steel, grounding bushing, insulated, 1" diameter	118	ea					
	Conduit fittings for rigid galvanized steel, grounding bushing, insulated, 1-1/2" diameter	1	ea					
	Conduit fittings for rigid galvanized steel, grounding bushing, insulated, 2" diameter	10	ea					
	Conduit fittings for rigid galvanized steel, plastic coated 40 mil thick, LB, LR or LL conduit body w/cover, 3/4" diameter	1	ea					
	Flexible Metallic Conduit							
	Flexible metallic conduit, sealtite, 3/4" diameter	98	lf					
	Flexible metallic conduit, sealtite, connectors, plain, 3/4" diameter	49	ea					
	Flexible metallic conduit, sealtite, connectors, plain, 90 Deg., 3/4" diameter	49	ea					
	Subtotal							213,000.-

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26 0543	**UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS**							
	Pull boxes, cast iron, water & dust tight, 6" L x 6" W x 6" D, NEMA 4, surface mounting	10	ea					
	Pull boxes, cast iron, water & dust tight, 24" L x 24" W x 10" D, NEMA 4, surface mounting	1	ea					
	Subtotal							21,000.
26 2200	**LOW VOLTAGE TRANSFORMERS**							
	Transformer, dry-type, ventilated, 3 phase 480 V primary 120/208 V secondary, 30 kVA	1	ea					
	Cabinet, current transformer, double door, 48"H x 36"W x 10"D	1	ea					
	Subtotal							20,000.
26 2416	**PANELBOARDS**							
	Panelboards, 3 phase 4 wire, main circuit breaker, 277/480 V, 225 amp, 30 circuits, NEHB, incl 20 A 1 pole plug-in breakers	1	ea					
	Circuit breakers, auxiliary switch, 2 pole, 240 V, 100 amp	1	ea					
	Circuit breakers, auxiliary switch, 2 pole, 240 V, 150 amp	1	ea					
	Switchboards, main circuit breaker, 3 pole, 4 wire, 277/480 volt, 400 amp	1	ea					
	Cabinet, raintight & weatherproof, 36" L x 36" W x 12" D, NEMA 3R	1	ea					
	Subtotal							25,000.
26 2726	**WIRING DEVICES**							
	Duplex receptacle, ground fault interrupting, 20 amp, wp	8	ea					
	Card Access Reader at Sliding Gate	2	ea					
	Card Access Reader at Gate, Wiring & Programming	1	ls					
	Sliding Gate Mechanism	1	ea					
	Subtotal							2,000.

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26 5000	**LIGHTING**							
	Interior Lighting Control Components	1	ls					
	Subtotal							~~12,000~~ 23,000
26 5600	**EXTERIOR LIGHTING**							
	Lighting Poles							
	Light poles, 30' high, for photovoltaic control box	1	ea					
	Flood Lighting							
	Floodlights							
	Light fixture - type "EULP3"	8	ea					
	Light fixture - type "Star Light"	12	ea					
	Light fixture - type "STE02" (60lf/each)	8	ea					
	Light fixture - type "STE03" (35lf/each)	8	ea					
	Light fixture - type "WFL2B"	6	ea					
	Light fixture - type "WFL3A"	13	ea					
	Light fixture - type "WFL3B"	9	ea					
	Lighting Accessories							
	Energy Saving Lighting Devices							
	Photocell for lighting control	2	ea					
	Photovoltaic system complete	1	ea					
	Emergency Phone Station							
	Telephone, wall/pole mounted emergency phone station w/LED	1	ea					
	Subtotal							225,000
31 0000	**EARTHWORK**							
31 0916	**DRIVEN PILE LOAD TESTS**							
	Piling miscellanoeus costs, testing, any type piles, lateral load test	2	ea					
	Subtotal							51,000

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31 0917	**DYNAMIC PILE TESTING**							
	Piling miscellaneous costs, testing, any type piles, lateral load test	2	ea					
	Subtotal							52,000
31 2316	**EXCAVATION - EARTH AND ROCK**							
	Earthwork Equipment Rental (with operators)							
	Rent backhoe-loader 45 to 60 HP 3/4 CY capacity		day					
	Rent backhoe-loader wheel type 80 HP 1-1/4 CY capacity		day					
	Soils for Earthwork							
	Borrow							
	Soils for earthwork, common borrow, spread with 200 H.P. dozer, includes load at pit and haul, 2 miles round trip, excludes compaction		cy					
	Soils for earthwork, borrow, spread with 200 HP dozer, includes load at pit and haul, round trip, excludes compaction, for 5 mile haul, add		cy					
	Aggregates for Earthwork							
	Borrow							
	Aggregate for earthwork, bank run gravel, spread with 200 H.P. dozer, includes load at pit and haul, 2 miles round trip, excludes compaction	491	cy					
	Fine Grading							
	Finish Grading							
	Fine grading, fine grade for landscaped area, machine	3309	sy					
	Excavation							
	Structural Excavation for Minor Structures							
	Excavating, trench or continuous footing, common earth, 1/2 C.Y. excavator, 4' to 6' deep, excludes sheeting or dewatering		cy					

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	Excavating, trench or continuous footing, common earth, 3/4 C.Y. excavator, 6' to 10' deep, excludes sheeting or dewatering		cy					
	Structural Excavation for Minor Structures							
	Strt excvt for minor strtr,bank measr,for sprd and mat ftngs,elevtr pits,and small bldng fndtns,common earth,1 cy bucket,machin excvtn,hydrlc backhoe		cy					
	Excavating, Bulk Bank Measure Excavating, bulk bank measure, 1 C.Y. capacity = 75 C.Y./hour, backhoe, hydraulic, crawler mounted, excluding truck loading	3654	cy					
	Hauling							
	Hauling of excavated soil, 8 cy truck	456	load					
	Disposal of Contaminated Material	3654	cy					
	Subtotal							606,000
31 2323	**BACKFILLING**							
	Backfill, Structural							
	Backfill, Select Fill	2674	cy					
	Backfill, place Structural and Planting Soils, 50' Haul		cy					
	Backfill, place Sturctural and Planting Soils, 150' haul, includes compaction		cy					
	Fill by Borrow and Utility Bedding							
	Fill by borrow and utility bedding, for pipe and conduit, crushed stone, 3/4" to 1/2", excludes compaction		cy					
	General Fill							
	Fill, gravel fill, compacted, under floor slabs, 12" deep	2005	sf					
	Compaction							
	Compaction, 2 passes, 18" wide,12" lifts, walk behind, vibrating plate		ecy					
	Compaction, 2 passes, 6" to 11", 4" lifts, rammer tamper		ecy					
	Subtotal							212,000

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31 2500	**SLOPE PROTECTION AND EROSION CONTROL**							
	Rolled Erosion Control Mats and Blankets							
	Inlet filter protection	10	ea					
	Geotextile Soil Stabilization							
	Geotextile soil stabilization, geotextile fabric, woven, 200 lb. tensile strength	3510	sy					
	Geotextile soil stabilization, geotextile fabric, woven, heavy duty, 600 lb. tensile strength		sy					
	Geotextile soil stabilization, geotextile fabric, non-woven, 120 lb, tensile strength, includes scarifying and compaction		sy					
	Subtotal							17,000
31 3219	**DEMARCATION FABRIC**							
	Geotextile Demarcation Fabric	3309	sy					
	Subtotal							13,000
31 6216	**STEEL H-PILES**							
	Sheet Steel Piles							
	Sheet steel piles, "H" Sections, 85' long, HP12 x 53, excludes	4590	vlf					
	Pile, joint splice	54	ea					
	Piling miscellaneous costs, cutoffs, steel pile or "H" pile	54	ea					
	Mobilization, 75 ton, set up and remove crane, with pile leads and pile hammer	1	ea					
	Subtotal							500,000
32 0000	**EXTERIOR IMPROVEMENTS**							
32 1010	**CONCRETE CURBS**							
	Cast-in place concrete curbs & gutters, concrete, wood forms, straight, 6" x 18", includes concrete	84	lf					

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	Cast-in place concrete curbs & gutters, concrete, wood forms, radius, 6" x 18" radius, includes concrete	117	lf					
	Cast-in place concrete curbs & gutters, concrete, steel forms, straight, 3" high, includes concrete	23	lf					
	Subtotal							24,000.
32 1216	**ASPHALT PAVEMENT FOR STREET RESTORATION** Asphalt Restoration	1	ls					
	Subtotal							10,000.
32 1313	**CONCRETE PAVING**							
	Sidewalks, driveways, and patios, sidewalk, concrete, cast-in-place with 6 x 6 - W2.9 x W2.9 mesh, broomed finish, 3000 psi, 5" thick, excludes base	1574	sf					
	Sidewalks, driveways, and patios, sidewalks, concrete, excludes base, for 6" thick bank run gravel base, add		sf					
	Subtotal							99,000.
32 1316	**EXPOSED AGGREGATE CONCRETE PAVING**							
	Sidewalks, driveways, and patios, sidewalks, concrete, for exposed aggregate finish, excludes base, add to above	2065	sf					
	Subtotal							40,000.
32 1410	**STABILIZED GRAVEL PAVING**							
	Base course drainage layers, aggregate base course for roadways and large paved areas, compacted, 4" deep, crushed 3/4" stone base	607	sy					
	Base course drainage layers, aggregate base course, stone base, compacted, 3/4" stone base, to 6" deep	607	sy					

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	Base course drainage layers, aggregate base course for roadways and large paved areas, stone base, compacted, 3/4" stone base, to 6" deep	229	sy					
	Base course drainage layers, aggregate base course, stone base, compacted, 3/4" stone base, to 6" deep		sy					
	Base course drainage layers, aggregate base course for roadways and large paved areas, stone base, compacted, 3/4" stone base, to 6" deep		sy					
	Base course drainage layers, aggregate base course for roadways and large paved areas, stone base, compacted, 3/4" stone base, to 12" deep		sy					
	Subtotal							102,000
32 1420	**STONE PAVING**							
	Bluestone paving, bedding, coarse washed sand bed, 2" thick	8544	sf					
	Limestone paving, bedding, mortar, 1" thick	645	sf					
	Granite block patio, bedding, mortar, 1" thick	3510	sf					
	Granite block swale trail, bedding, mortar, 1" thick	1849	sf					
	Mortar bedding, 1" thick	755	sf					
	Stone Paving Proprietary Item 1: Type A Granite Block Pavers at Fan Pattern (Cold Spring Granite Royal Auburn) & Type B Granite Block Pavers at Swale Trail (Cold Spring Lake Placid Blue) & Type C Granite Block Pavers at Swale Trail Edge Bands (Cold Spring Mountain Green)	5359	sf					
	Stone Paving Proprietary Item 1: Type D Granite Bridge Ramps(Cold Spring Granite Lake Superior Green)	1	ls					
	Stone Paving Proprietary Item 2: Type H Limestone pavers, 3" thick, excludes base	645	sf					
	Stone Paving Proprietary Item 3: Type I Bluestone Flagstone Pavers	8544	sf					

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	Sidewalks, driveways, and patios, bedding, mortar, 3/4" thick, excludes base		sf					
	Sidewalks, driveways, and patios, bedding, mortar, 1/2" thick, excludes base		sf					
	Sidewalks, driveways, and patios, bedding, mortar, 1" thick, excludes base		sf					
	Sidewalks, driveways, and patios, bedding for brick or stone, mortar, 1" thick, excludes base		sf					
	Subtotal							556,000
32 3119	**DECORATIVE FENCES AND GATES**							
	Decorative metal fences and gates, tubular picket, stainless steel, 4' high, Powder Coated, South	30	lf					
	Decorative metal fences and gates, tubular picket, steel, 7'-6" high, Powder Coated, South	383	lf					
	Decorative metal fences and gates, tubular picket, steel, 10' high, Powder Coated, South		lf					
	Decorative metal fences and gates, tubular picket, steel, ave 8'-6" high, Powder Coated, South	23	lf					
	Powdercoating & Anti-Vandalism Coating at South Fence Fence, ornamental, gate, electric slide, stainless steel, 12'-8"w x 10'h	3068 1	sf ea					
	Fence, ornamental, stainless steel, at East Entrance	57	lf					
	Fence, ornamental, gate, stainless steel, 8'w x 8'h	1	ea					
	Fence, ornamental, stainless steel	54	lf					
	Fence, ornamental, gate, stainless steel, 3'-6"w x 6'-6"h	1	ea					
	Subtotal							292,000

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32 4010	**STONEWORK**							
	Stonework Proprietary Item 4: Wood & Stone Benches (Cold Spring Granite Lake Superior Green) & Stone Seating at Circular Shelter (Cold Spring Granite Glacier Blue) & Stone and Steel Tables and Benches (Cold Spring Granite Mountain Green) & Stone Drinking Fountain (Cold Spring Granite Morton Gneiss)	1	ls					
	Stonework Proprietary Item 5: Linear Stone Benches (Williams Stone Co. Chester Gray Granite) & Linear Stone Boulders (Williams Stone Co. Chester Gray Granite)	1	ls					
	Subtotal							278,000
32 4020	**WOOD FURNISHINGS**							
	Timber Seats	1	ls					
	Wood Edging, Pressure Treated, ~~14"X14"X8'~~ 12"X12"X8' (2)	95	ea					
	Subtotal							46,000
32 4030	**SITE FURNISHINGS**							
	Site Equipment							
	Bike rack, permanent, DOT standard	6	ea					
	Trash Receptacles							
	Receptacle, trash, 1 and 2 opening lids	3	ea					
	Site Seating							
	Pipe seat, galvanized, inc. base and top plate, anchor bolts(3 ea), 12" diameter x 18" high	10	ea					
	Pipe seat, galvanized, inc. base and top plate, anchor bolts(3 ea), 14" diameter x 18" high	10	ea					
	Pipe seat, galvanized, inc. base and top plate, anchor bolts(3 ea), 16" diameter x 18" high	12	ea					
	Fence, Chain Link, Gates & Posts							

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	Fence,chain link, gates & posts, line posts,galvanized, (1/3 post length in ground), 2-1/2" OD, 8', set in concrete, includes excavation	39	ea					
	Fence,chain link, gates & posts, end posts, chain link fence, galvanized steel, (1/3 post length ground), 3" od, 8', set concrete, includes excavation	4	ea					
	Fence,chain link,gates&posts,corner posts,chain link fence,galvanized steel,(1/3 post length ground),4"od,8',set concrete,includes excavation	4	ea					
	Chain link fence gates and posts, auger fence post hole, medium soil, 3' deep, by machine, includes excavation		ea					
	Fence, fabric & accessories, barbed wire, galvanized, cost per strand	310	lf					
	Wire fencing & gates, wire fencing general, chain link fabric, steel, galvanized, 6 ga., 2" mesh	25	csf					
	Vehicle Guide Rails							
	Vehicle guide rails, corrugated steel, galvanized steel posts, steel posts 8' O.C, W4 x 2'-6" posts	101	lf					
	Subtotal							296,000
32 4050	**SIGNAGE**							
	Information sign, star plaque, drinking fountain plaque	3	ea					
	Information sign, tree fossil plaque, entrance sign	3	ea					
	Information sign, soil boring sign and post	1	ea					
	Subtotal							34,000
32 8400	**IRRIGATION**							
	Sprinkler Irrigation System							
	Irrigation System	7037	sf					
	Subtotal							116,000

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32 9113	**CU STRUCTURAL SOIL**							
	Structural Soils	2121	cy					
	Subtotal							280,000
32 9320	**PLANTING SOIL MIX**							
	Planting beds preparation, mix planting soil, skid steer loader, includes loam	938	cy					
	Subtotal							211,000
32 9330	**PLANTING**							
	Shrubs, ornamental grasses and perennials	1	ls					
	Trees							
	Deciduous trees, small	503	ea					
	Deciduous trees, large	62	ea					
	Landscape edging, steel edge strips, 1/4" x 5", incl. stakes	855	lf					
	Tree Guying Systems Tree anchoring, underground system, duckbill earth anchor and rope, 3" to 4" caliper, 3 per tree	25	ea					
	Mulching							
	Soil preparation, mulching, aged barks, 3" deep, hand spread	782	sy					
	Subtotal							207,000
33 0000	**UTILITIES**							
33 0513	**SANITARY AND STORM SEWER STRUCTURES**							
	Piping, Drainage & Sewage, Corrugated HDPE							
	Overflow structure, polypropolyene, includes grate	2	ea					
	Stormwater retention structure, polypropolyene arch	210	lf					
	Subtotal							43,000

Department of Design and Construction

Fratello Corporation
134 [illegible]
Farmingdale, New York 11735

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
33 0550	**LAYING AND JOINTING BURIED PIPELINES**							
	Drain piping, ductile iron pipe, mechanical joint,fittings, 18' lengths, 6"diameter	260	lf					
	Drain piping, fitting, 90 degree bend or elbow, mechanical joint, ductile Iron, 6" diameter	10	ea					
	Drain piping, fitting, tee, ductile Iron, mechanical joint, 6" diameter	15	ea					
	Subtotal							85,000.-
33 0555	**BURIED DUCTILE IRON PIPE AND FITTINGS**							
	Water Supply, Ductile Iron Pipe							
	Drain piping, ductile iron pipe, mechanical joint,fittings, 18' lengths, 6" diameter		lf					
	Water supply distribution piping,ductile iron pipe,cement lined,mechanical joint,fittings,18' lengths,8"diameter,class 50, excludes excavation backfill	367	lf					
	Water supply distribution piping, fitting, 90 degree bend or elbow, mechanical joint, ductile iron, cement lined, 8" diameter, class 50 water piping	4	ea					
	Water supply distribution piping, fitting, 45 degree bend, ductile iron, cement lined,mechanical joint, 8" diameter, class 50 water piping	2	ea					
	Catchbasins							
	Utility Area Drains, catch basins or manholes inverts, channel brick, various depths, excludes footing, excavation, and backfill	2	ea					
	Tapping, Crosses and Sleeves							
	Water Service Connection, tapping sleeves with rubber gaskets, 6"x3", excludes excavation and backfill	1	ea					
	Water Service Connection, tapping sleeves with rubber gaskets, 8" x 8", excludes excavation and backfill	1	ea					
	Subtotal							93,000.-

Department of Design and Construction

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CSI Number	Description	Quantity	Unit	Unit Cost of Material	Total Cost of Material	Unit Cost of Labor	Total Cost of Labor	Total Cost: Materials and Labor
33 1219	**HYDRANTS**							
	Yard hydrant, non-freeze, all bronze, set flush; 3/4"ips connection, 4 feet depth bury	3	ea					
	Fire Hydrants							
	Water Utility Distribution Fire Hydrants, two way, 3'-0" depth, 4-1/2" valve, includes mechanical joints, excludes excavation and backfill	2	ea					
	Subtotal							28,000.
33 1300	**DISINFECTION**							
	Disinfection	1	ls					
	Subtotal							4,000.
40 0000	**PROCESS INTERCONNECTIONS**							
40 0518	**MISCELLANEOUS PIPE AND FITTINGS**							
	Drain piping, fitting, 90 degree bend or elbow, mechanical joint, ductile iron, 6" diameter	1	ea					
	Drain piping, fitting, tee, ductile iron, mechanical joint, 6" diameter	1	ea					
	Subtotal							1,000.
40 0520	**VALVES**							
	Valves	1	ls					
	Subtotal							1,000.
	TOTAL CONTRACT 1 - GENERAL CONSTRUCTION WORK							8,683,8%

ATTACHMENT 1 – BID INFORMATION
PROJECT ID: NC-61A

DESCRIPTION AND LOCATION OF WORK:

Renovation of the Newtown Creek Nature Walk, Phase III
329 Greenpoint Avenue
Brooklyn, NY 11222
DDC PIN: 8502018CT0002C **EPIN: 85018B0124**

DOCUMENTS AVAILABLE AT:

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

SUBMISSION OF BIDS BEFORE BID OPENING:

TIME TO SUBMIT:

On or Before: OCTOBER 4, 2018

BIDS MUST BE CLOCKED IN PRIOR TO BID OPENING

PLACE TO SUBMIT:

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

PRE BID QUESTIONS (PBQs):

Please be advised that PBQs must be submitted to the Agency Contact Person at least five (5) business days (by 5:00 P.M. EST) prior to the bid opening date.
Email PBQ(s) - CSB_projectinquiries@ddc.nyc.gov

BID OPENING:

PLACE OF BID OPENING:	Department of Design and Construction
	Contract Section
	30-30 Thomson Avenue - First Floor
	Long Island City, NY 11101
DATE AND HOUR:	**OCTOBER 4, 2018 @ 2:00PM**

LATE BIDS WILL NOT BE ACCEPTED

PRE-BID CONFERENCE:

PLACE	**Newtown Creek Nature Walk** **329 Greenpoint Avenue** **Brooklyn, NY 11222**
DATE AND HOUR	**SEPTEMBER 12, 2018 @ 10:00AM**
MANDATORY OR OPTIONAL	**OPTIONAL**

BID SECURITY:

Bid Security is required in the amount set forth below; provided, however, bid security is not required if the TOTAL BID PRICE set forth on the Bid Form is less than $1,000,000.00.

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

PERFORMANCE AND PAYMENT SECURITY:

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

AGENCY CONTACT PERSON:

Lorraine Holley, 30-30 Thomson Avenue - First Floor, Long Island City, Queens, 11101
Telephone (718) 391-1041 Email: CSB_projectinquiries@ddc.nyc.gov

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BID BOOKLET
PART B

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SAFETY QUESTIONNAIRE

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

1. Bidder Information:

Company Name: Fratello Construction Corp.

DDC Project Number: NC-61A

Company Size: X Ten (10) employees or less

_____ Greater than ten (10) employees

Company has previously worked for DDC X YES _____ NO

2. Type(s) of Construction Work

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

3. Experience Modification Rate:

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

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

YEAR	INTRASTATE RATE	INTERSTATE RATE
2018	.95	
2017	.95	
2016	.95	

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

4. OSHA Information:

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

____ YES _X_ 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 (all work-related impatient hospitalizations, all amputations and all losses of an eye).

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

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

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

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

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

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
TBTA Service Building Alterations at the Hugh Carey Tunnel Brooklyn, NY	Single Prime General Construction	$ 8,394,343	2017	Kelley Bray 718-797-6927	
School Based Health Clinic at PS 18 for NYC SCA Bronx, NY	Single Prime PLA General Construction	$ 5,789,304	2017	Nawras Souker 718-752-5738	
NY Psychiatric Institute Conversion of 4th Floor to to Wet Lab, Bldg No. 4 Manhattan, NY	Single Prime General Construction	$ 7,070,000	2016	Carlos Silva 212-543-0804	
Children's Zoo Renovation Bronx Zoo Bronx, NY	Single Prime General Construction	$ 2,416,890	2014	Ken Hutchinson 718-741-1783	
Children's Zoo Staff Building Bronx Zoo Bronx, NY	Single Prime General Construction	$ 306,157	2014	Ken Hutchinson 718-741-1783	
Construction of New Day Care Center at SUNY Farmingdale Farmingdale, NY	Single Prime General Construction	$ 5,619,044	2013	Lee Newton 518-320-3223	
Elmhurst Hospital Center Emergency Dept. Chest Pain Unit Elmhurst, NY	Single Prime	$ 1,442,614	2012	David Klung 718-334-3362	

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
Bronx Psychiatric Center Ginsberg Recovery Center Bldg 5 Renovation Bronx, NY	Single Prime PLA General Construction	$ 12,794,553	$ 8,100,000	$ 115,000	December, 2018	Jhony Gutierrez 718-824-3040	
SUNY Old Westbury Renovation of Library/Academic Space Old Westbury, NY	Single Prime General Construction	$ 9,244,289	$ 6,000,000	$ 400,000	December, 2018	Lee Newton 518-320-3223	
Engine Co. 293 Gut Rehabilition Woodhaven, NY	Single Prime PLA General Construction	$ 8,616,651	$ 5,800,000	$ 400,000	November, 2018	Lou Volpe - LIRO 718-441-0241 Amir Nossrati - DDC 646-772-1350	

C. PROJECT REFERENCES – PENDING CONTRACTS NOT YET STARTED BY THE BIDDER

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

Project & Location	Contract Type	Contract Amount ($000)	Date Scheduled to Start	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. if different from owner
NOT APPLICABLE					

OFFICE OF THE MAYOR
BUREAU OF LABOR SERVICES
CONTRACT CERTIFICATE

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

Contractor: _____

Address: _____

_____

Telephone Number: _____

Name and Title of Signatory: _____

_____

Contracting Agency or Owner: _____

Project Number: _____

Proposed Contract Amount: _____

Description and Address of Proposed Contract: _____

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

_____

_____

_____

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

_____ _____
Date Signature

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

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VENDEX COMPLIANCE

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

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

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

Name of Bidder: Fratello Construction Corp.
Bidder's Address: 134 Milbar Blvd, Farmingdale, NY 11735
Bidder's Telephone Number: 631-414-7171
Bidder's Fax Number: 631-414-7170
Date of Bid Opening: 10/4/2018
Project ID: NC-61A

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

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

Date of Submission: _____

By: _____
(Signature of Partner or corporate officer)

Print Name: _____

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

By: _____
(Signature of Partner or corporate officer)

Print Name: Guilio Cianci

Certificate of No Change Form

Mayor's Office of Contract Services

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

I, Guilio Cianci, being duly sworn, state that I have read
Enter Your Name

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

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

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

Vendor Questionnaire *This section is required.*

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

Name of Submitting Entity: Fratello Construction Corp.

Vendor's Address: 134 Milbar Boulevard, Farmingdale, NY 11735

Vendor's EIN or TIN: 11-2992307 Requesting Agency: DDC

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

Signature date on the last full vendor questionnaire signed for the submitting vendor: 8/10/18

Signature date on change submission for the submitting vendor: _____

Principal Questionnaire

This section refers to the most recent principal questionnaire submissions.

Mayor's Office of Contract Services

	Principal Name	Date of signature on last full Principal Questionnaire	Date(s) of signature on submission of change
1	Stephen Bono	8/10/18	
2	Guilio Cianci	8/10/18	
3			
4			
5			
6			

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

Certification *This section is required.*

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

Certified By:

Guilio Cianci

Name (Print)

Vice President/Secretary

Title

Fratello Construction Corp,

Name of Submitting Entity

Signature 10/4/2018 *Date*

Notarized By:

Joan M. Knoblach *Notary Public* Nassau *County License Issued* 01KN4815346 *License Number*

Sworn to before me on: 10/4/2018 *Date*

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

IRAN DIVESTMENT ACT COMPLIANCE RIDER

FOR NEW YORK CITY CONTRACTORS

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

(a) The person provides goods or services of twenty million dollars or more in the energy sector of Iran, including a person that provides oil or liquefied natural gas tankers, or products used to construct or maintain pipelines used to transport oil or liquefied natural gas, for the energy sector of Iran; or

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

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

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

(1) The investment activities in Iran were made before the effective date of this section (i.e., April 12, 2012), the investment activities in Iran have not been expanded or renewed after the effective date of this section and the person has adopted, publicized and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran: or

(2) The City makes a determination that the goods or services are necessary for the City to perform its functions and that, absent such an exemption, the City would be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

BIDDER'S CERTIFICATION OF COMPLIANCE WITH IRAN DIVESTMENT ACT

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

[*Please Check One*]

BIDDER'S CERTIFICATION

[X] By submission of this bid or proposal, each bidder/proposer and each person signing on behalf of any bidder/proposer certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief, that each bidder/proposer is not on the list created pursuant to paragraph (b) of subdivision 3 of Section 165-a of the State Finance Law.

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

Dated: Farmingdale, New York
October 4, 2018

SIGNATURE

Guilio Cianci
PRINTED NAME

Vice President/Secretary
TITLE

Sworn to before me this
4th day of Oct, 2018

Joan M. Knoblach
Notary Public

Dated: October 4, 2018

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

CITY OF NEW YORK

DIVISION OF LABOR SERVICES

CONSTRUCTION EMPLOYMENT REPORT

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

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

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

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

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

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

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

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

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

5. Are you a Union contractor? Yes __X__ No ____ If yes, please list which local(s) you affiliated with various unions signed to PLA agreements on projects we have worked on

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

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

7. 11-2992037 — Employer Identification Number or Federal Tax I.D.
info@fratelloconstruction.com — Email Address

8. Fratello Construction Corp.
Company Name

9. 134 Milbar Boulevard, Farmingdale, NY 11735
Company Address and Zip Code

10. Guilio Cianci — Chief Operating Officer
631-414-7171 — Telephone Number

11. same
Designated Equal Opportunity Compliance Officer (If same as Item #10, write "same")
Telephone Number

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

13. Number of employees in your company: 9

14. Contract information:

(a) NYC DDC
Contracting Agency (City Agency)

(b) _____
Contract Amount

(c) 8502018CT0002C
Procurement Identification Number (PIN)

(d) _____
Contract Registration Number (CT#)

(e) _____
Projected Commencement Date

(f) _____
Projected Completion Date

(g) Description and location of proposed contract:

Renovation of the Newtown Creek Nature Walk, Phase III

329 Greenpoint Avenue, Brooklyn, NY 11222

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

If yes, attach a copy of certificate.

16. Has DLS within the past month reviewed an Employment Report submission for your company and issued a Conditional Certificate of Approval? Yes___ No_x_

If yes, attach a copy of certificate.

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

17. Has an Employment Report already been submitted for a different contract (not covered by this Employment Report) for which you have not yet received compliance certificate?
Yes___ No_X_ If yes,

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

18. Has your company in the past 36 months been audited by the United States Department of Labor, Office of Federal Contract Compliance Programs (OFCCP)? Yes___ No_X_

If yes,

(a) Name and address of OFCCP office.

_____

_____

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

If yes, attach a copy of such certificate.

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

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

(d) Were any deficiencies found? Yes___ No_X_

If yes, attach a copy of such findings.

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

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

PART II: DOCUMENTS REQUIRED

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

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

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

___ (c) Employee Policy/Handbook

___ (d) Personnel Policy/Manual

___ (e) Supervisor's Policy/Manual

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

___ (g) Collective bargaining agreement(s).

___ (h) Employment Application(s)

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

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

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

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

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

In locked employee file cabinets in main office.

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

If yes, is the medical examination given:

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

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

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

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

25. Does the company have a current affirmative action plan(s) (AAP) Yes
_____Minorities and Women
_____Individuals with handicaps
_____Other. Please specify

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

If yes, please attach a copy of this policy.

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

27. Has any employee, within the past three years, filed a complaint pursuant to an internal grievance procedure or with any official of your firm with respect to equal employment opportunity? Yes___ No_X_

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

28. Has your firm, within the past three years, been named as a defendant (or respondent) in any administrative or judicial action where the complainant (plaintiff) alleged violation of any anti-discrimination or affirmative action laws? Yes___ No_X_

If yes, attach a log. See instructions.

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

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

_____

_____

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

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

_____

_____

SIGNATURE PAGE

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

Fratello Construction Corp
Contractor's Name

Joan Knoblach — Admin Asst
Name of person who prepared this Employment Report — Title

Guilio Cianci — Vice President/Secretary
Name of official authorized to sign on behalf of the contractor — Title

631-414-7171
Telephone Number

Signature of authorized official — 10/4/2018 Date

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

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

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

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

Only original signatures accepted.

Sworn to before me this 4th day of October 2018

Notary Public — Authorized Signature — 10/4/2018 Date

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

FOR OFFICIAL USE ONLY: File No._____

FORM B: PROJECTED WORKFORCE

TO BE SUBMITTED UPON NOTICE OF LOW BIDDER

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

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

Total Female (Col. #6 – 10): _____

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

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

_____

_____

TO BE SUBMITTED UPON NOTICE OF LOW BIDDER

FORM C: CURRENT WORKFORCE

TRADE CLASSIFICATION CODES

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

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

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

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

Total Female (Col. #6 – 10): _____

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

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

_____

_____

FOR OFFIC USE ONLY: File No._____

FORM C: CURRENT WORKFORCE TO BE SUBMITTED UPON NOTICE OF LOW BIDDER

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

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

Total Female (Col. #6 – 10): _____

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

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

_____

_____

YEAR	TOTAL NUMBERS OF HOURS WORKED BY EMPLOYEES	INCIDENT RATE

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

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

5. Safety Performance on Previous DDC Project(s)

__x__ YES ___ NO Contractor previously audited by the DDC Office of Site Safety.

DDC Project Number(s): _____, _____, _____

___ YES __x__ NO Accident on previous DDC Project(s).

DDC Project Number(s): _____, _____, _____

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

DDC Project Number(s): F175EC293, _____, _____

Date: 10/4/2018

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

Title: Vice President/Secretary

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

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

2. If yes, complete the chart below.

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

SUBCONTRACTOR'S NAME*	OWNERSHIP (ENTER APPROPRIATE CODE LETTERS BELOW)	WORK TO BE PERFORMED BY SUBCONTRACTOR	TRADE PROJECTED FOR USE BY SUBCONTRACTOR	PROJECTED DOLLAR VALUE OF SUBCONTRACT
TO BE SUBMITTED UPON NOTICE OF LOW BIDDER				

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

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

FORM B: PROJECTED WORKFORCE TO BE SUBMITTED UPON NOTICE OF LOW BIDDER

TRADE CLASSIFICATION CODES

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

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

Trade: _____

Union Affiliation, if applicable _____

Total (Col. #1-10): _____

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

Total Female (Col. #6 – 10): _____

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

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

_____

_____

FOR OFFIC USE ONLY: File No._____

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

September 11, 2018

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

NC-61A
RENOVATION OF THE NEWTOWN CREEK NATURE WALK, PHASE III

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

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

1. **The Pre-Bid Site Conference date for the contract described below scheduled for September 12, 2018 is rescheduled to September 13, 2018 at 10:00 AM.**

   Contract #1 – General Construction Work

   Please remember required PPE equipment: Construction Boots, Hard Hat, and Safety Vest.

   Meeting Location: **329 Greenpoint Avenue**
   Brooklyn, NY 11222
   Room 108 in the CM Building

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 or by fax at (718) 391-2627.

Bogdan Pestka, FAIA
Assistant Commissioner
Transportation, DEP, and
Sanitation Programs

Fratello Construction Corp
Name of Bidder

By: Guilio Cianci

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

September 26, 2018

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

NC-61A
NEWTOWN CREEK NATUREWALK PHASE 3

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

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

1. **Bidders Questions and Responses to Questions:**
   See Attachment A.

2. **Revisions to Drawings:**
   See Attachment B

3. **Revisions to the Bid Breakdown**
   See Attachment C

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 or by fax at (718) 391-2627.

Bogdan Pestka
Assistant Commissioner
Transportation, DEP, and
Sanitation Programs

Fratello Construction Corp.
Name of Bidder

By: Guilio Cianci
Guilio Cianci

Attachment A
Addendum #2
September 26, 2018

DDC PROJECT #: NC-61A

PROJECT NAME: NEWTOWN CREEK NATUREWALK PHASE 3

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	Is the step stone bench on L-407 stone in the allowances?	Yes, stepped stone bench material is paid for under Proprietary Item #5. Payment shall be per LF of each step.
2	Can you provide the basis of design manufacturers for the Site Furnishings 32 40 30 - 2?	All items are to be custom fabricated, they are not catalog items that can be purchased from a manufacturer.
3	Having read the proprietary items pages 2a & 2b, the specs. and L-103 it's not clear what's in the allowances. a.) Large & small granite table & benches? If so with engraving? b.) Detail 3 on L-408, Is the vertical stone boulders in an allowance? c.) Detail 4 on L-408, is the stone element in an allowance? d.) Detail 5 on L-408, is the stone bench in an allowance e.) What happens if costs exceed allowances? f.) Please confirm allowances do not include freight.	Refer to stone plan, drawing L-107. Reference designations (Type A, Type B etc.) in list of Proprietary Items match designations on Drawing L-107. All Proprietary Items (materials only) are paid as an Allowance. a.) Granite tables and benches are included in Proprietary Items #4. Engraving to be paid separately. b.) Vertical stones are paid for under Stone Boulders which is not a Proprietary Item. c.) Vertical stones are paid for under Stone Boulders which is not a Proprietary Item. d.) Stone Bench is paid for under Proprietary Items #5. e.) It becomes a change order, but you're locked in to that unit price. f.) Allowances do not include freight or installation, includes material cost only.
4	Natural Stone Boulders the specification has the commissioner "selecting" & us buying? How do we price?	Sizes of boulders are shown on the drawings, finish should be natural except for saw cut back at vertical boulder. Assume stone boulders are purchased from Cold Spring Granite.
5	Tree Fossils, are they fragile? Any special moving considerations?	They are not fragile (same consistency as stone) but they are very old and should be handled and moved extremely carefully, as specified in Item 324010.
6	Will stone items in allowances come with metal (rails)? If not by stone supplier is there a basis of design?	Allowance cost covers only the purchase of the stone itself. All other items are paid separately.
7	Who does the etching at stone table? If not the stone supplier did you have someone in mind?	Etching to be done by stone supplier or specialist engraver selected by contractor.
8	Where are the Moon boots and Foot imprints called out? Page 21-7	Imprints are shown on drawing L-415. Imprint template will be supplied by the site artist (George Trakas) who will imprint them into the wet concrete at the time of installation.

9	Wood edge detail calls for 12" square & pay item says 14" square?	Wood planting edge shall be 12" square as shown on detail 4, drawing L-406. Attached to this addendum.
10	Is the exposed aggregate concrete to match the wall facing the water in phase one?	Yes.
11	There is a significant amount of piles that need to be installed in the project, will there be vibration monitoring required on the existing bulkhead, concrete wall, or any of the existing buildings/structures in the nearby vicinity.	The contractor is required to perform vibration monitoring of existing structures in accordance with Section 1.10 of Specification Item 316216 - Steel H-Piles. The contractor is required to submit a vibration monitoring plan to the Engineer for review and approval.
12	Considering that the jobsite location has water access, is there an opportunity for barge access for the jobsite?	No.
13	During the pre-bid meeting, it was stated that our electrical and plumbing subcontractors need to be established and their prices will be read out with the overall bid price, because of the difficulty of getting a subcontractor agreement that will satisfy both the prime and subcontractor, is it possible to get a time extension on the bid date, to have more time to negotiate the necessary details with these critical subcontractors?	No

Attachment B
Addendum #2
September 26, 2018

DDC PROJECT #: NC-61A

PROJECT NAME: NEWTOWN CREEK NATUREWALK PHASE 3

ATTACHMENT B – REVISIONS TO THE DRAWINGS

Drawing L-102 attached to this addendum

Attachment C
Addendum #2
September 26, 2018

DDC PROJECT #:

PROJECT NAME:

ATTACHMENT C – REVISIONS TO THE BID BREAK DOWN

Page 22, attached to this addendum

Department of Design and Construction

CONTRACTOR'S BID BREAKDOWN FORM

CONTRACT 1 - GENERAL CONSTRUCTION

Project: Newtown Creek Nature Walk: Phase 3 Garden
Location: 329 Greenpoint Avenue, Brooklyn, NY 11222
Bidder: _____

DDC ID: NC-61A
Sponsor Agency: DEP

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
	Fence, ornamental, gate, electric slide, stainless steel, 12'-8"w x 10'h		ea					
	Fence, ornamental, stainless steel, at East Entrance		lf					
	Fence, ornamental, gate, stainless steel, 8'w x 8'h		ea					
	Fence, ornamental, stainless steel		lf					
	Fence, ornamental, gate, stainless steel, 3'-6"w x 6'-6"h		ea					
	Subtotal							
32 4010	**STONEWORK**							
	Stonework Proprietary Item 4: Wood & Stone Benches (Cold Spring Granite Lake Superior Green) & Stone Seating at Circular Shelter (Cold Spring Granite Glacier Blue) & Stone and Steel Tables and Benches (Cold Spring Granite Mountain Green) & Stone Drinking Fountain (Cold Spring Granite Morton Gneiss)		ls					
	Stonework Proprietary Item 5: Linear Stone Benches (Williams Stone Co. Chester Gray Granite) & Linear Stone Boulders (Williams Stone Co. Chester Gray Granite)		ls					
	Subtotal							
32 4020	**WOOD FURNISHINGS**							
	Timber Seats		ls					
	Wood Edging, Pressure Treated, 12' X 12' X 8'		ea					
	Subtotal							
32 4030	**SITE FURNISHINGS**							
	Site Equipment							
	Bike rack, permanent, DOT standard		ea					
	Trash Receptacles							

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

September 27, 2018

ADDENDUM No. # 3

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

NC-61A
NEWTOWN CREEK NATUREWALK PHASE 3

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

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

1. **Bidders Questions and Responses to Questions:**
   See Attachment A.

2. **Revisions to Drawings:**
   See Attachment B

3. **Revisions to the Bid Booklet, Volume 1**
   See Attachment C.

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 or by fax at (718) 391-2627.

Bogdan Pestka
Assistant Commissioner
Transportation, DEP, and
Sanitation Programs

Fratello Construction Corp.
Name of Bidder

By: _____
Guilio Cianci

Attachment A
Addendum #3
September 26, 2018

DDC PROJECT #: ***NC-61A***

PROJECT NAME: **NEWTOWN CREEK NATUREWALK PHASE 3**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	It was stated in the pre-bid meeting that it will be problematic to move in a different direction then the originally bid subcontractors for the plumbing and electrical work. This can lead to some strange situations in which a subcontractor can have multiple prices for multiple bidders on the same contract, or a situation in which the low bidder does not have the lowest subcontractor prices. If these cases exist is the city open to a value engineered proposal that will allow a lower substituted cost and or subcontractor for the same work after the bid opening?	If necessary an identified subcontractor can be switched after registration but only if agreed upon and approved by NYC DDC, however, the price for that trade is set in the bid and cannot change.
2	Will the city accept any value engineering based alternatives to materials or processes in order to reduce the overall price of the project, if the alternatives are agreed upon?	The bid must be submitted for the project as indicated in the bid documents. A value engineered bid is not acceptable.
3	There is a portion of the electrical work that my vendor has an issue with. The photovoltaic system specifically. I have copied his email below with the issues that the system has. The first concern are the wire runs. There is absolutely no way that they will work, especially at low voltage DC. The battery/controller enclosure and panels should not be more than ~20' from each other at 12VDC. Running wires, the way that is shown in the drawing will fail. Even at 24VDC, it's impossible. The next concern is the lamp selection. It looks like they want to light a total of 12 MP Lighting L07 0.3W lamps. I looked on their website, and it looks like MP has particular dimming drivers that they'd require for use with the L07 lamps. From what I can tell, their driver is AC input and DC output. That will not work with our equipment. Our stuff needs to be all DC. As for the driver, even if it were all DC, there's no way to know if it would actually work with our equipment. Even if something works "on paper" it still needs test bench time. I am sure that engineering will reject my request for testing for a single unit project. I hate to put it like that because it sounds rude, but that really is the situation. For the SolarOne part number on the schedule, it is only part of a system. It's only a 12V panel, mounting brackets, a battery/controller enclosure,	The photovoltaic system design for the Star Lights will be modified to provide the proper required output to power the starlight fixtures. a. Wire runs must be designed by the photovoltaic system manufacturer before the distance can be determined. SolarOne technical engineer stated that for an example of a 50 watt system at 12DC can be located as far as 75 feet from the battery/controller. b. Non Dimming DC input / DC output drivers will be used. Per the specifications a LED driver is needed and these drivers can be a DC input to DC output drivers, the photovoltaic specification is a performance specification. Coordination with the vendor must occur to design the system. c. Coordination with the vendor to design a proper system based on the performance specification must occur. d. The part number has been removed from the contract drawings, a detail of the required pole is shown on drawing L-405. Per the performance specification provide a pole that meets the requirements. Revised drawings E-106 and E-108 showing revised layout and block diagrams are included with this response.

	some old drivers which probably won't work, and a ground wire. That "component bundle" is meant to be used as part of a system that Philips Hadco sells which includes the pole and 3 x i25 in-ground lamps. I honestly don't know if the i25 is available anymore. Hadco provided the pole and lamps for whatever project that part number came from. They buy the parts from us then sell the complete system. As a Philips Value Added Partner, SolarOne can both integrate some of their AC products into our DC systems as well as help them do the same on their end. As you know, there's no way to quote as specified. None if it will work. Maybe we can explore alternative designs in the future.	
4	We are in the process of bidding on above referenced project. Bid due on 10/4/2018 @ 2:00 PM. Per Bid Booklet, it is required to submit completed Bid Breakdown with the bid. Bid Breakdown Forms are attached herewith. We need to fill out quantity, material cost, labor cost and total cost for lot of items. As the forms are in PDF, could you please provide us Excel bid forms for accuracy of calculation.	The Excel bid form will be provided to the Contractor awarded the project.
5	New South fence goes beyond contract limits?	Limit of fencing work on south wall shall be from western end of wall to first step of wall height, approximately 27' to the west of the face of the Whale Creek bulkhead at Road E.
6	The concrete wall at bulkhead doesn't meet south wall, there is an H-pile that has conduit on it. The plans don't address the H-pile, what is to become of it? See picture attached.	The H-pile will be cut below grade and the concrete wall at bulkhead will be extended to south wall as part of the work of this contract. Drawing C-102 notes removal of the conduits. Removal or rerouting to be coordinated in the field.
7	Does section 2 on S-108 match the sections on L-303?	The concrete work shown on the S-108 shall take precedence over that shown-on L-303. Finished materials grade elevations shall be as shown on L-303.
8	Coping and panels to match existing, who supplied the existing? Is there a detail for fastening the panels to the wall?	No information about the supplier of the existing precast is available. See the attached sketch SK-1 for precast panel and coping fastening.
9	I didn't realize at time (no mention by DDC) the plans require the contractor "verify if field" measurements for fence pricing and wall panels. I will need a 2nd site visit ASAP. Please to take measurements to provide to subcontractors and supplier.	There will not be a second walk through. Please refer to Grading Plan L-116 to L-118 for bottom of wall elevations. See Survey (sheet 4) for existing top of wall elevation. See drawing A-102 for wall elevation.
10	Please confirm the electrician installs light fixtures on the fence posts of south fence.	Yes, all electrical work to be performed by licensed electrician
11	Can on-site fill be used to backfill the Northside of the North wall?	Excavated material may be reused if it is tested and shows conformance with the material requirements specified in item 312323 – Backfilling.
12	Please provide quantities for unit prices on bid booklet page 13-0, which must be returned with bid and totals included in proposal.	Please see attached unit price schedule.

13.	What are the cladding panel heights?	See Grading Plan L-116 to L-118 for bottom of wall elevations. See Survey (sheet 4) for existing top of wall elevation.
	Are most of the cladding panels about 6" thick?	Yes, panels and copings are 6" thick.
	Is there rebar required for the coping or cladding panels?	The need for reinforcement should be determined based on satisfying the loading requirements in Section 1.4A (performance requirements) of the Specification.

Attachment B
Addendum #3
September 27, 2018

DDC PROJECT #: ***NC-61A***

PROJECT NAME: **NEWTOWN CREEK NATUREWALK PHASE 3**

ATTACHMENT B – REVISIONS TO THE DRAWINGS

attached to this addendum
- E-106
- E-108
- SK-1

LIGHT FIXTURE SCHEDULE

LOCATION	FIXTURE TYPE	DESCRIPTION	MANUFACTURER/CATALOG NO.	LAMP QTY.	LAMP TYPE	MATERIALS/ FINISH COLOR	CONTROL GEAR*	LOAD TYPE**	EXTENDED WATTAGE [W]	UNITS (EACH/PER LF)	VOLTAGE [V]	COMMENTS
CONCRETE WALL AT KINSLAND AVENUE	EUPL3	EXTERIOR-RATED WALL RECESSED COMPACT FLUORESCENT	BEGA: 2320p, OR APPROVED EQUAL +INSTALLATION HOUSING	1	COMPACT FLUORESCENT QUAD-2P G24d-2 BASE 18W 4000K	STAINLESS STEEL	IEB	FN	20	EA	120	
TOP OF BULKHEAD AT WATERFRONT	WFL2B	EXTERIOR-RATED IN-GROUND RECESSED LED WALL WASHER UNBREAKABLE LENS, TAMPER PROOF SCREWS	KIM LIGHTING: LTVB2FT/WW/18L/4K/UV, OR APPROVED EQUAL	1	METAL HALIDE ED-17 70W 4000K	CAST BRONZE	IEB	HID	84	EA	120	
VARIOUS	WFL3A	EXTERIOR-RATED POLE MOUNTED CUSTOM FIXTURE WITH STAINLESS STEEL CONSTRUCTION AND HARDWARE, WATER-TIGHT CLEAR ACRYLIC TUBULAR ENCLOSURE, INTEGRAL BALLAST	CRENSHAW 18513-SEC-A-LA-SS-CG, OR APPROVED EQUAL +ROSCO FILTER #21 GOLDEN AMBER +STAINLESS STEEL POLE 3" DIA, 8'-0" HIGH	N/A	LED	SATIN STAINLESS STEEL	IEB	LED	47	EA	120	
FENCE AT ROAD	WFL3B	EXTERIOR-RATED FENCE MOUNTED CUSTOM FIXTURE WITH STAINLESS STEEL CONSTRUCTION AND HARDWARE, WATER-TIGHT, CLEAR ACRYLIC TUBULAR ENCLOSURE, INTEGRAL BALLAST	CRENSHAW 18513-SEC-B-LA-SS-CG, OR APPROVED EQUAL +ROSCO FILTER #146 DARK BLUE +CUSTOM STAINLESS STEEL FENCE ADAPTER +CURVED PERFORATED PANEL TO SHIELD LAMP	N/A	LED	SATIN STAINLESS STEEL	IEB	LED	47	EA	120	
SHELTER 2 (CIRCULAR)	STE02	EXTERIOR-RATED SURFACE MOUNTED LINEAR LED	FLEX LIGHTING: FX-XXXX-XX-85 B, OR APPROVED EQUAL +MOUNTING ACCESSORIES +CONNECTORS +REMOTE POWER SUPPLY	N/A	LED BLUE	N/A	RLD	LED	3	LF	120/24	
SHELTER 1 (BOAT SHAPED)	STE03	EXTERIOR-RATED SURFACE MOUNTED LINEAR LED	12 SYSTEMS: GEN3 V3285A-X8C9A, OR APPROVED EQUAL +MOUNTING ACCESSORIES, +FITTED BRACKET +OUTDOOR RATED POWER SUPPLY +CONNECTORS AND CABLES	N/A	LED WARMWHITE 2700K	BLACK	RLD	LED	0	LF	120/24	
*STAR LIGHT BENCH	STAR LIGHT	EXTERIOR-RATED RECESSED LED REFER TO LANDSCAPE DRAWINGS FOR DETAILS	MP LIGHTING: LD7-W27S-S6, OR APPROVED EQUAL +OUTDOOR RATED REMOTE POWER SUPPLY +MOUNTING ACCESSORIES	1	LED WARMWHITE 2.7 LUMEN	STAINLESS STEEL	RLD	LED	0.3	EA	12/24	
*VARIOUS	POLE	EXTERIOR-RATED POLE		1	N/A	GALVANIZED STEEL	N/A	N/A	N/A	EA		
UTILITY SHED LIGHT	UTILITY LIGHT	INTERIOR AND EXTERIOR WALL MOUNTED LUMINAIRE	BEGA: 3518LED, OR APPROVED EQUAL	1	LED 4.3W	STAINLESS STEEL		LED	4.3	EA	120	

*REFER TO DWG L-405 FOR STAR LIGHT AND POLE DETAILS.

LANDSCAPE ARCHITECTS
Quennell Rothschild & Partners, LLP
132 Nassau Street, New York, NY 10038

ARCHITECTURAL/CIVIL/ELECTRICAL ENGINEERING
Greeley and Hansen LLC
111 Broadway, 21st Floor, New York, NY 10006

STRUCTURAL ENGINEERING
The Burns Group, Inc.
1261 Broadway, Suite 708, New York, NY 10001

GEOTECHNICAL ENGINEERING
Mueser Rutledge Consulting Engineers
14 Penn Plaza, New York, NY 10122

IRRIGATION DESIGN
Wasler-Cohen Associates
740 Broadway, Amityville, NY 11701

LIGHTING DESIGN
L'Observatoire International
120 Walker Street, New York, NY 10013

REVISIONS:

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 2 ISSUED FOR BID	09-04-2018 09-27-2018

Department of Design and Construction
DIVISION OF PUBLIC BUILDINGS

CAPITAL PROJECT NUMBER:
NC-61A

PROJECT
Newtown Creek Nature Walk Phase 3
Greenpoint Avenue, Brooklyn, NY

FOR THE:
NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION

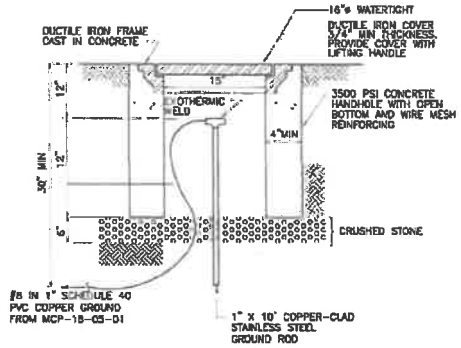
DRAWING TITLE:

LIGHT FIXTURE SCHEDULE

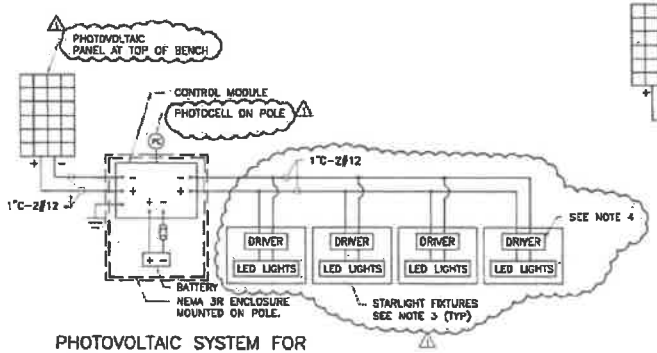
BLOCK NUMBER: 2525
LOT NUMBER: 1
DDC APPROVAL STAMP

SEAL & SIGNATURE

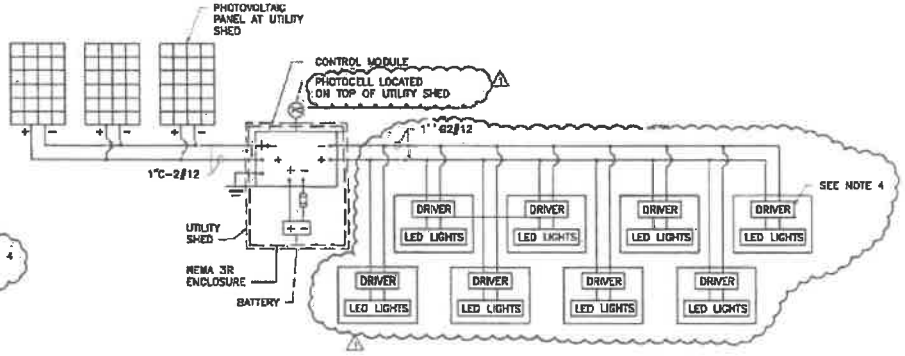
DATE: 27 July, 2018
PROJECT NO: NC-61A
DRAWN BY: TNT
CHECKED BY: DEA
DRAWING NUMBER:
E-106.00
CADD FILE No: NC61A_E106.00



GROUND TEST WELL
DETAIL NO. 1



PHOTOVOLTAIC SYSTEM FOR
STAR LIGHTS BLOCK DIAGRAM



PHOTOVOLTAIC SYSTEM AT UTILITY SHED
FOR STAR LIGHTS BLOCK DIAGRAM

SCALE: 1/4" = 1'-0"

NOTES:
1. QUANTITY OF PHOTOVOLTAIC PANELS MAY VARY PER MANUFACTURERS REQUIREMENTS.
2. PHOTOVOLTAIC SYSTEM SHALL BE FURNISHED AND INSTALLED BY A CONTRACTOR WITH SUCCESSFUL EXPERIENCE IN INSTALLING PHOTOVOLTAIC SYSTEMS IN ACCORDANCE WITH LIGHTING SPECIFICATION 26 50 00.
3. REFER TO LIGHTING AND POWER PLANS FOR QUANTITY AND LOCATION OF STARLIGHT BENCHES. THEY ARE NOT SHOWN ON BLOCK DIAGRAMS FOR BREVITY.
4. PROVIDE DC INPUT/ DC OUTPUT LED TYPE DRIVER FOR LED LIGHTS.

BLOCK NUMBER: 2525

LOT NUMBER: 1

DOB APPROVAL STAMP

LANDSCAPE ARCHITECTS
Quennell Rothschild & Partners, LLP
132 Nassau Street, New York, NY 10038

ARCHITECTURAL/CIVIL/ELECTRICAL ENGINEERING
Greeley and Hansen LLC
111 Broadway, 21st Floor, New York, NY 10006

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The Burns Group, Inc.
1261 Broadway, Suite 708, New York, NY 10001

GEOTECHNICAL ENGINEERING
Mueser Rutledge Consulting Engineers
14 Penn Plaza, New York, NY 10122

IRRIGATION DESIGN
Wasser-Cohen Associates
740 Broadway, Amityville, NY 11701

LIGHTING DESIGN
L'Observatoire International
120 Wooker Street, New York, NY 10013

REVISIONS:

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 3	06-26-2018
	ISSUED FOR BID	07-27-2018

Department of Design and Construction

DIVISION OF PUBLIC BUILDINGS

CAPITAL PROJECT NUMBER:
NC-61A

PROJECT
Newtown Creek Nature Walk Phase 3
Greenpoint Avenue, Brooklyn, NY

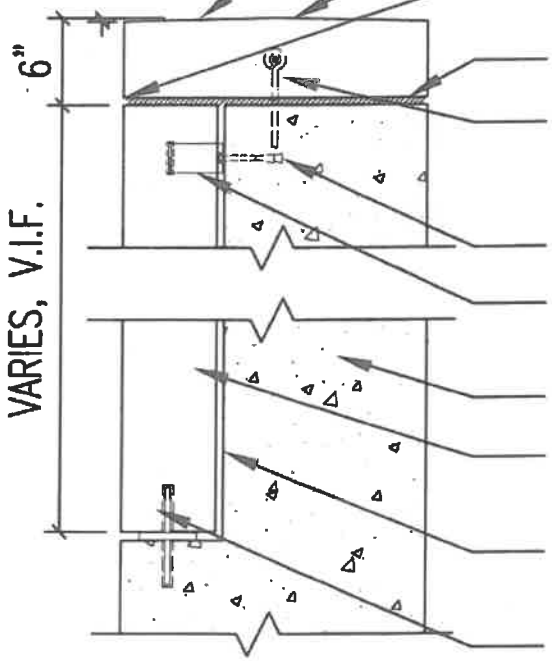
FOR THE:
NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAWING TITLE:

MISCELLANEOUS ELECTRICAL DETAILS

SEAL & SIGNATURE

DATE: 27 JULY, 2018
PROJECT NO. NC-61A
DRAWN BY: TMT
CHECKED BY: DSA
DRAWING NUMBER:
E-108.00
CADD FILE No:



PRECAST CONCRETE COPING, TAPERED TO SIDES, 5'-0" LENGTH TYPICAL

SEALANT AT COPING JOINTS

SEALANT, BOTH SIDES AND VERTICAL JOINT

MORTAR UNDER COPING PRECAST

S.STL. DOWEL ROD WITH SEALANT AROUND AND EYE BOLT ANCHOR BETWEEN COPING STONES

ANCHOR BOLT

S. STL. SPLIT TAIL STRAP ANCHOR ON SIDES OF PRECAST

EXISTING CONCRETE WALL

PRECAST CONCRETE CLADDING, 5'-0" LENGTH TYPICAL

MAINTAIN A ½" AT THE BACK AND BASE OF PRECAST FOR DRAINAGE

S. STL. DOWEL RODS WITH SEALANT AROUND WELDED TO ½" S. STL. PLATE TOP AND BOTTOM

PRECAST PANEL ANCHORAGE DETAIL

1" = 1'-0"

DES DR BMS	CKD APPD
GREELEY AND HANSEN ARCHITECTS, L.L.C. CHICAGO, ILLINOIS	**NC-61A** **NEWTOWN CREEK NATURE WALK PHASE 3** **SOUTH FENCE PRECAST WALL** 09/25/18 SK-1

Attachment C
Addendum #3
September 27, 2018

DDC PROJECT #:

PROJECT NAME:

ATTACHMENT C – REVISIONS TO THE BID BOOKLET

Revised Unit Price Schedule

Unit Price Schedule

FMS ID: **NC-61A**

Unit Price items: The items of work set forth in the Schedule below shall be performed by the contractor on a unit price basis for additional work. Such items of work shall be performed by the contractor only as directed in writing by the Commissioner.

The unit price for the items of work in the Schedule below are for EXTRA WORK ONLY i.e., work which is above and beyond that described in the Drawings and Specifications.

The bidder shall submit prices for all the items of work in the Schedule below. The bidder shall insert the total sum for all unit price items on the Bid Form, Item D - Amount for Unit Prices. The unit price bid for each item shall include all costs and expense for the item, i.e., labor, material, overhead and profit. Quantities shown are approximate and for bid comparison purposes only. Actual amounts to be determined when the work is performed.

CSI #	Item #	Item Description	Quant	Units	Unit Price	Total
31 2316	1	Soils for earthwork, common borrow, spread with 200 H.P. dozer, includes load at pit and haul, 2 miles round trip, excludes compaction	260	CY		
31 2316	2	Soils for earthwork, borrow, spread with 200 HP dozer, includes load at pit and haul, round trip, excludes compaction, for 5 mile haul	260	CY		
31 2316	3	Excavating, bulk bank measure, 1 C.Y. capacity = 75 C.Y./hour, backhoe, hydraulic, crawler mounted, excluding truck loading	315	CY		
31 2316	4	Hauling of excavated soil, 8 cy truck	57	Load		
31 2316	5	Disposal of Contaminated Material	452	CY		
31 2323	6	Backfill, Select Fill	164	CY		
31 2323	7	Backfill, place Structural and Planting Soils, 50' Haul	146	CY		
31 2323	8	Backfill, place Sturctural and Planting Soils, 150' haul, includes compaction	146	CY		
31 6216	10	Sheet steel piles, "H" Sections, 85' long, HP12 x 53, excludes mobilization or demobilization	459	VLF		
31 6216	11	Pile, joint splice	6	EA		
31 6216	12	Piling special costs, cutoffs, steel pile or "H" pile	6	EA		

Total Amount of Unit Price Work $_____

* Insert Total amount of Unit Price Work on line D of Bid Form

Note: All quantities are approximate

FMS ID: **NC-61A**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Department of Design and Construction

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

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn, NY 11222**
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: **NC-61A**

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

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

VOLUME 2 OF 3

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

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

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn, NY 11222**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

DEP

Quennell Rothschild & Partners

Date: **June 5, 2018**

Department of Design and Construction

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

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

VOLUME 2 OF 3

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

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

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, by emailing DSBS at MWBE@sbs.nyc.gov, by calling the DSBS certification hotline at (212) 513-6311, or by visiting or writing DSBS at 110 William St., 7th floor, New York, New York, 10038.

The local collective bargaining agreements (CBAs) that are incorporated into the PLA as PLA Schedule A Agreements are available on computer disk from the Department's Contract Officer upon the request of any prospective bidder. Please note that the "PLA Schedule A" is distinct from the Department's Schedule A that is a part of this invitation for bids.

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

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

1. **Q.** Does a Contractor need to be signatory with the unions in the NYC Building and Construction Trades Council in order to bid on projects under the PLA?
   A. No, any contractor may bid by signing and agreeing to the terms of the PLA. The contractor need not be signatory with these unions by any other labor agreement or for any other project.

2. **Q.** Does a Contractor agreeing to the PLA and signing the Letter of Assent create a labor agreement with these unions outside of the project covered by the PLA?
   A. No, the PLA applies only to those projects that the Contractor agrees to perform under the PLA and makes no labor agreement beyond those projects.

3. **Q.** Do the provisions of the PLA apply equally to subcontractors as well as contractors and how does the PLA affect the subcontractors that a bidder may utilize on the project?
   A. Yes, the PLA applies to subcontractors and all subcontractors must agree to become party to the PLA. See PLA Art. 2, Sec. 8. Subject to the Department's approval of subcontractors pursuant to Article 17 of the Standard Construction Contract, a Contractor may use any subcontractor, union or non-union, as long as the subcontractor signs and agrees to the terms of the PLA.

4. **Q.** Are bidders required to submit Letters of Assent signed by proposed subcontractors with their bid in order to be found responsive?
   A. No, bidders do not have to submit signed Letters of Assent from their subcontractors with their bid. Subcontractors, however, will be required to sign the Letter of Assent prior to being approved by the Department.

5. **Q.** May a Contractor or subcontractor use any of its existing employees to perform this work?
   A. Generally labor will be referred to the Contractor from the respective signatory local unions. See PLA Article 4. However, Contractors and subcontractors may continue to use up to 12% of their existing, qualifying labor force for this work, in accordance with the terms of PLA Article 4, Section 2B. Certified M/WBEs for which participation goals are set pursuant to NYC Administrative Code §6-129 that are not signatory to any Schedule A CBAs may use their existing employees for the 2nd, 4th , 6th and 8th employee needed on the job if their contracts are valued at or under $500,000. For contracts valued at above $500,000 but under $1,000,000, such certified M/WBEs may use their own employees for the 2nd, 5th and 8th employees needed on the job in accordance with the provisions of PLA Article 4, Section 2C. If additional workers are needed by these M/WBEs, the additional workers will be referred to the Contractor from the signatory local unions subject to the Contractor's right to meet 12% of the additional needs with its existing, qualifying employees.

6. **Q.** Must the City set M/WBE participation goals for the particular project or contract in order for a certified M/WBE to utilize the provisions of PLA Article 4, Section 2C?
   A. No. PLA Article 4, Section 2(C) specifies what categories of M/WBEs are eligible to take advantage of this provision (i.e., those M/WBEs for which the City is

authorized to set participation goals under §6-129). For purposes of section 2(C), it is not necessary for the project to be subject to §6-129 or for the City to have actually set participation goals for the particular contract or project. The result is the same where a projects receives State funding and therefore is subject to the requirements of Article 15-A of the Executive Law.

7. **Q.** May a Contractor bring in union members from locals that are not signatory unions?
   A. Referrals will be from the respective signatory locals and/or locals listed in Schedule A of the PLA. Contractors may utilize 'traveler provisions' contained in the local collective bargaining agreements (local CBAs) where such provisions exist and/or in accordance with the provisions of PLA Article 4, Section 2.

8. **Q.** Does a non-union employee working under the PLA automatically become a union member?
   A. No, the non-union employee does not automatically become a union member by working on a project covered by the PLA. Non-union employees working under the PLA are subject to the union security provisions (i.e., union dues/agency shop fees) of the local CBAs while on the project. These employees will be enrolled in the appropriate benefit plans and earn credit toward various union benefit programs except in certain circumstances as set forth in the PLA. See PLA Article 4, Section 6 and Article 11.

9. **Q.** When will the agency shop dues payer affiliate workers become eligible for union benefits?
   A. Union benefit plans have their own plan documents that determine eligibility and workers will become eligible for certain benefits at different points in time. Contractors who will have agency shop dues payer affiliate workers should speak with the respective union(s) as to benefit eligibility thresholds.

10. **Q.** Are all Contractors and subcontractors working under the PLA, including non-union Contractors and Contractors signatory to collective bargaining agreements with locals other than those that are signatories to the PLA, required to make contributions to designated employee benefit funds?
    A. Except in certain circumstances, as described in the following paragraph, Contractors and subcontractors working under the PLA will be required to contribute on behalf of all employees covered by the PLA to established jointly trusteed employee benefit funds designated in the Schedule A CBAs and required to be paid on public works under any applicable prevailing wage law. See PLA Article 11, Section 2. The Agency may withhold from amounts due the Contractor any amounts required to be paid, but not actually paid into any such fund by the Contractor or a subcontractor. See PLA Article 11, Section 2 D.

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

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

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

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

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

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

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

14. **Q.** May a contractor discharge a union referral for lack of productivity?
A. Again, except as expressly limited by a specific provision of the PLA, a Contractor retains full and exclusive authority for the management of their operations, including the right to discipline or discharge for just cause its employees. See PLA Article 6, Section 1.

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

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

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

17. **Q.** Does the PLA create a common holiday schedule for all the signatory trades?
A. Yes, the PLA recognizes nine (9) common holidays, including Veterans Day. See PLA Article 12, Section 4.

18. **Q.** Does the PLA provide for a standard policy for 'shift work' across all signatory trades?
A. Yes, second and third shifts may be worked with a standard 5% premium pay. In addition, a day shift does not have to be scheduled in order to work the second and third shifts at the 1.05 hourly pay rate. See PLA Article 12, Section 3.

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

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

21. **Q.** Are there special provisions for Saturday work when a day is 'lost' during the week due to weather, power failure or other emergency?
A. Yes, when this occurs the Contractor may schedule Saturday work at weekday rates. See PLA Article 12, Section 5.

22. **Q.** Does the PLA contain special provisions for the manning of Temporary Services?

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

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

24. **Q.** Should a local collective bargaining agreement of a signatory union expire during the project will a work stoppage occur on a project subject to the PLA?
A. No. All the signatory unions are bound by the 'no strike' agreement as to the PLA work. Work will continue under the PLA and the otherwise expired local CBA(s) until the new local CBA(s) are negotiated and in effect. See PLA Articles 7 and 19.

25. **Q.** May a Contractor working under the PLA be subject to a strike or other boycott activity by a signatory union at another site while the Contractor is a signatory to the PLA?
A. Yes. The PLA applies ONLY to work under the PLA and does not regulate labor relations at other sites even if those sites are in close proximity to PLA work.

26. **Q.** If a Contractor has worked under other PLAs in the New York City area, are the provisions in this PLA generally the same as the others?
A. While Project Labor Agreements often look similar to each other, and particular clauses are often used in multiple agreements, each PLA is a unique document and should be examined accordingly.

27. **Q.** What happens if a dispute occurs between the Contractor and an employee during the project?
A. The PLA contains a grievance and arbitration process to resolve disputes between the Contractor and the employees. See PLA Article 9.

28. **Q.** What happens if there is a dispute between locals as to which local gets to provide employees for a particular project or a particular aspect of a project?
A. The PLA provides for jurisdictional disputes to be resolved in accordance with the NY Plan. See PLA Article 10. A copy of the NY Plan is available upon request from the

Department. The PLA provides that work is not to be disrupted or interrupted pending the resolution of any jurisdictional dispute. The work proceeds as assigned by the Contractor until the dispute is resolved. See PLA Article 10, Section 3.

29. **Q.** Does the 2015 Renovation PLA contain special provisions for JOCS or task order based Contracts?

A. The PLA does not apply to Task Orders or Work Orders that do not exceed $10,000 issued under JOCS or Requirements Contracts otherwise subject to the PLA. See PLA Article 3, Section 1.

NYC Project Labor Agreements

CONTACT INFORMATION FOR LOCAL UNIONS (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, 9th Fl
New York, New York 10014
Phone: (212) 366-7500
Fax: (212) 675-3140
Business Manager: Joe Geiger
John Sheehy, D.C. Rep.

CEMENT MASONS NO. 780
150-50 14th Rd Suite 4
Whitestone, NY 11357
Phone: (718) 357-3750
Fax: (718) 357-2057
Business Manager: Gino Castingnoli

CONCRETE WORKERS
DISTRICT COUNCIL NO. 16
29-18 35th Avenue
Long Island City, NY 11106
Phone: (718) 392-5077
Fax: (718) 392-5087
Business Manager: Alex Castaldi

DERRICKMEN & RIGGERS LOCAL 197
35-53 24th Street
Long Island City, NY 11101
Phone: (718) 361-6534
Fax: (718) 361-6584
Business Manager: William Hayes
Billhayes197@yahoo.com

DRYWALL TAPERS 1974
265 West 14th Street
New York, NY 10011
Phone: (212) 242-8500
Fax: (212) 242-2356
Business Manager: Sal Marsala

ELECTRICAL LOCAL NO. 3
158-11 Harry Van Arsdale, Jr. Avenue
Flushing, NY 11365
Phone: (718) 591-4000
Fax: (718) 380-8998
Business Manager: Chris Erickson
Raymond Melville, Asst. Bus. Mgr.
Construction

ELEVATOR CONSTRUCTORS NO. 1
47-24 27th Avenue
Long Island City, NY 11101
Phone: (718) 767-7004
Fax: (718) 767-6730
Business Manager: Lenny Legotte
llegotte@localoneiuec.com

ENGINEERS LOCAL 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 11th 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 44th Street
New York, NY 10036
Phone: (212) 245-7040
Fax: (212) 245-7886
Business Manager: Kuba Brown
kubabrown@local94.com

GLAZIERS NO. 1087
45 West 14th 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 24th Street
Long Island City, NY 11101
Phone: (718) 784-3456
Fax: (718) 784-8357
Business Manager: Matty Aracich
matty@insulatorslocal12.com

HEAT & FROST INSULATORS LOCAL UNION NO. 12A
1536 127th Street
College Point, NY 11356
Phone: (718) 886-7226
Business Manager: Jaime Soto

IRON WORKERS DISTRICT COUNCIL
22 West 46th Street
New York, NY 10036
Phone: (212) 302-1868
Business Manager: James Mahoney
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 97th 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 8th Avenue
New York, NY 10018
Phone: (212) 465-7900
Fax: (212- 465-7903
Business Manager: Michael Prohaska

LABORERS NO. 731
34-11 35th Avenue
Astoria, NY 11106
(718) 706-0720
Business Manager: Joseph D'Amato

LATHERS METAL
LOCAL NO. 46
1322 Third Avenue
New York, NY 10021
Phone: (212) 737-0500
Fax: (212) 249-1226
Business Manager: Terrance Moore

MASON TENDERS DIST. COUNCIL
520 8th Avenue
New York, NY 10018
Phone: (212) 452-9400
Fax: (212) 452-9499
Business Manager: Robert Bonanza

METAL POLISHERS
LOCAL UNION NO. 8A-28A
36-18 33rd Street 2nd 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 42nd Street
New York, NY 10036
Phone: (212) 594-1662
Fax: (212) 564-2748
Business Manager: Pete Myers

PAINTERS DISTRICT
COUNCIL NO. 9
45 West 14th Street
New York, NY 10011
Phone: (212) 255-2950
Fax: (212) 255-1151
Business Manager: Joseph Azzopardi

PAINTERS STRUCTURAL STEEL
NO. 806
40 West 27th Street
New York, New York 10001
Phone: (212) 447-1838/0149
Fax: (212) 545-8386
Business Manager: Angelo Serse

PAVERS & ROAD BUILDERS
DISTRICT COUNCIL NO. 1
136-25 37th 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 43rd 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 44th 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 48th 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 44th 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

PROJECT LABOR AGREEMENT

COVERING SPECIFIED

RENOVATION & REHABILITATION OF CITY OWNED BUILDINGS AND STRUCTURES

2015 - 2018

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

ARTICLE 1 - PREAMBLE

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

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

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

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

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

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

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

(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.

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."

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

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

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.

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:

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

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,

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

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.

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.

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 (2nd), fourth (4th), sixth (6th), and eighth (8th) 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.

For such contracts valued at above $500,000 but less than $1 million, the Local will honor referrals by name of the second (2nd), fifth (5th), and eighth (8th) 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

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

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.

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.

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.

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.

In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6- MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to, the right to: direct the work force, including determination as to the number of employees to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; require compliance with the directives of the Agency including standard restrictions related to security and access to the site that are equally applicable to Agency employees, guests, or vendors; or the discipline or discharge for just cause of its employees; assign and schedule work; promulgate reasonable Program Work rules that are not inconsistent with this Agreement or rules common in the industry and are reasonably related to the nature of work; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual, as determined by the Contractor, Agency and/or Construction Manager and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitation or restriction upon the Contractor's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast,

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

ARTICLE 7- WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Program Work site for any reason by any Union or employee against any Contractor or employer. There

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

SECTION 2. DISCHARGE FOR VIOLATION

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

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the Local Union involved advising of such fact, with copies of the notification to the Council. The Local Union shall instruct and order, the Council shall request, and each shall otherwise use their best efforts to cause, the employees (and where necessary the Council shall use its best efforts to cause the Local Union), to immediately cease and desist from any violation of this Article. If the Council complies with these obligations it shall not be liable for the unauthorized acts of a Local Union or its members. Similarly, a Local Union

and its members will not be liable for any unauthorized acts of the Council. Failure of a Contractor or the Construction Manager to give any notification set forth in this Article shall not excuse any violation of Section 1 of this Article.

SECTION 4. EXPEDITED ARBITRATION

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

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

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

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

to present their case, and conduct their cross examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

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

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

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

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

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

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

SECTION 1. SUBJECTS

The Program Labor Management Committee 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

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:

(a) When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the work site representative of the involved Contractor and the Construction Manager. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence or event giving rise to the grievance. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved unless the settlement is accepted in writing by the Construction Manager (or designee) as creating a precedent.

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

Step 2:

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

Step 3:

(a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 21 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants, including the Construction Manager or designee) to the BCTC. In the event the matter is not resolved at Step 2, either J.J. Pierson or Richard Adelman, who shall act, alternately (beginning with Arbitrator J.J. Pierson), as the Arbitrator under this procedure, shall be designated at the Step 2 hearing and the BCTC will notify the arbitrator of his designation. After such notification by the BCTC, the local demanding arbitration shall within a reasonable time request the arbitrator to schedule the matter for an arbitration hearing date. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

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

SECTION 2. LIMITATION AS TO RETROACTIVITY

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

SECTION 3. PARTICIPATION BY AGENCY AND/OR CONSTRUCTION MANAGER

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

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

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

SECTION 2. ASSIGNMENT

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

SECTION 3. NO INTERFERENCE WITH WORK

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

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

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

SECTION 2. EMPLOYEE BENEFITS

A. The Contractors agree to pay on a timely basis contributions on behalf of all employees covered by this Agreement to those established jointly trusteed employee benefit funds designated in the applicable 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 trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly required under applicable prevailing wage law. Contractors, not otherwise contractually bound to do so, shall not be required to contribute to benefits, trusts or plans of any kind which are not required by the prevailing wage law provided, however, that this provision does not relieve Contractors signatory to local collective bargaining agreement with any affiliated union from complying with the fringe benefit requirements for all funds contained in the CBA.

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

satisfy the above benefit obligation with respect to those employees by providing those employees with coverage under their private benefit plans (to the extent consistent with Section 220). The total benefit payments to be made on behalf of each such employee must be equal to the total Section 220 supplement amount and any shortfall must be paid by cash supplement to the employee.

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

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

of Assent, satisfy its obligations for all employees, including core employees, by contributing to the Schedule A benefit plans in accordance with the terms of the Schedule A Agreements.

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

D. 1. To the extent consistent with New York City's Procurement Policy Board Rules with respect to prompt payment, as published at www.nyc.gov/ppb, §4-06(e), and in consideration of the unions' waiver of their rights to withhold labor from a contractor or subcontractor delinquent in the payment of fringe benefits contributions ("Delinquent Contractor"); the Agency agrees that where any such union and/or fringe benefit fund shall notify the Agency, the General Contractor, and the Delinquent Contractor in writing with back-up documentation that the Delinquent Contractor has failed to make fringe benefit contributions to it as provided herein and the Delinquent Contractor shall fail, within ten (10) calendar days after receipt of such notice, to furnish either proof of such payment or notice that the amount claimed by the union and/or fringe benefit fund is in dispute, the Agency shall withhold from amounts then or thereafter becoming due and payable to the General Contractor an amount equal to that portion of such payment due to the General Contractor that relates solely to the work performed by

the Delinquent Contractor which the union or fringe benefit fund claims to be due it, and shall remit the amount when and so withheld to the fringe benefit fund and deduct such payment from the amounts then otherwise due and payable to the General Contractor, which payment shall, as between the General Contractor and the Agency, be deemed a payment by the Agency to the General Contractor; provided however, that in any month, such withholding shall not exceed the amount contained in the General Contractor's monthly invoice for work performed by the Delinquent Contractor. The union or its employee benefit funds shall include in its notification of delinquent payment of fringe benefits only such amount it asserts the Delinquent Contractor failed to pay on the specific project against which the claim is made and the union or its employee benefit funds may not include in such notification any amount such Delinquent Contractor may have failed to pay on any other City or non-City project.

2. In addition, where a union or employee benefit fund gives notice to the City that a Contractor is Delinquent as defined in subsection 2(D)(1) above and the City determines that the notice includes appropriate back-up documentation that the Contractor is delinquent, the City will promptly, but not later than twenty (20) days after receipt of the notice, provide a copy of said notice to City Agencies. In the event the City determines there is insufficient back-up documentation, it will notify the appropriate union and/or fringe benefit fund promptly, but not later than twenty (20) days after receipt of the Delinquency Notice, and shall include notice of what additional documentation is requested. Any determination by the City that there is insufficient back-up must be reasonable. This provision is intended to enhance compliance with the prevailing wage

law and 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

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

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

ARTICLE 12- HOURS OF WORK, PREMIUM PAYMENTS,

SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND 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.

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

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.

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

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 of for similar circumstances beyond the Contractor's control, shall receive pay only for such time as is actually worked. In other instances in which an employee's work is terminated early (unless provided otherwise elsewhere in this Agreement), the employee shall be paid for 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

notify each employee directly and confirm that notification has been received. Voice, text, and email messages left for employees without confirmation of delivery and receipt by employee do not constitute sufficient notice under this provision.

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

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

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

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

SECTION 7. PAYMENT OF WAGES

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

SECTION 8. EMERGENCY WORK SUSPENSION

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

SECTION 9. INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than a full day's pay in accordance with the employee's regularly scheduled 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

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.

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.

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.

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.

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,

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

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.

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

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

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.

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

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

BY: _____
Gary LaBarbera
President

FOR NEW YORK CITY

BY:
Anthony Shorris
First Deputy Mayor

APPROVED AS TO FORM:

_____
ACTING CORPORATION COUNSEL
NEW YORK CITY

LIST OF SIGNATORY UNIONS
Boiler Makers Local No. 5
Carpenters District Council
Cement Masons No. 780
Concrete Workers, District Council No. 16
Derrickmen and Riggers, Local Union No. 197
Drywall Tapers 1974, District Council 9
Electrical Workers Local No. 3
Glaziers Local Union No. 1087 District Council 9
Heat & Frost Insulators, Local Union No. 12A
Heat & Frost Insulators, Local Union No. 12
Iron Workers District Council
Iron Workers Local Union No. 40
Iron Workers Local No. 361
Laborers Local No. 78, Asbestos & Lead Abatement
Laborers Local 1010 Pavers and Road Builders District Council
Laborers 79 Construction and General Building Laborers
Laborers Local No. 731 Excavators
Mason Tenders District Council
Metal Lathers Local No. 46
Metal Polishers District Council 9
Ornamental Iron Workers Local No. 580
Painters District Council 9
Plumbers Local No. 1
Painters, Decorators & Wallcoverers District Council 9
Painters Structural Steel No. 806
Plasterers Local Union No. 262
Roofers & Waterproofers Local 8
Steamfitters Local Union No. 638
Sheet Metal Workers Local No. 28
Sheet Metal Workers Local No. 137
Teamsters Local Union No. 282
Teamsters Local Union 814
Teamsters Local No. 813 Private Sanitation
Tile, Marble & Terrazzo B.A.C. Local Union No. 7
Elevator Constructors Union Local No. 1

SCHEDULE "A"

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

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

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

The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local No. 1556	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Millwright Local 740	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Manufacturing Woodworkers Association of Greater New York Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Hoisting Trade Association of New York, Inc.
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Test Boring Association

The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	Building Contractors Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Association of Wall-Ceiling & Carpentry Industries of New York, Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	The Cement League
The District Council of NYC and Vicinity of the United Brotherhood of Carpenters and Joiners of America	New York City Millwright Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	Greater New York Floor Covering Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Association of Architectural Metal & Glass
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Building Construction Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Local 2287	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Shop Carpenters	Independent
The Tile Setters and Tile Finishers Union of New York and New Jersey, Local 7 of the International Bricklayers and Allied Craftworkers	The Greater New York and New Jersey Contractors Association

United Derrickmen & Riggers Association, Local 197 of NY, LI, Westchester & Vicinity	Contracting Stonesetters Association Inc.
United Derrickmen & Riggers Association L 197 of NY, LI, Westchester and Vicinity	Building Stone and Pre-cast Contractors Association
International Union of Operating Engineers Local 14-14B	Building Contractors Association
International Union of Operating Engineers Local 14-14B	Contractors Association of Greater NY
International Union of Operating Engineers Local 14-14B	GCA
International Union of Operating Engineers Local 14-14B	The Cement League
International Union of Operating Engineers Local 14-14B	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 14-14B	Brick Association
International Union of Operating Engineers Local 14-14B	Independent
International Union of Operating Engineers Local 15	Allied Building Metal Industries, Inc.
International Union of Operating Engineers Local 15-15A	General Contractors Association
International Union of Operating Engineers Local 15D	General Contractors Association
International Union of Operating Engineers Local 15D	Structural Steel Erectors

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

ADDITIONAL PARTICIPATING UNIONS

Local No. 1 New York of the International Union of Bricklayers and Allied Craft Workers

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

NYC AGENCY RENOVATION & REHAB CITY OWNED BUILDINGS/STRUCTURES PLA

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 Renov. of Newtown Creek Nature Walk, Phase III, Project NC-61A and located at 329 Greenpoint Avenue Brooklyn, NY 11222 (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:

NYC AGENCY RENOVATION & REHAB CITY OWNED BUILDINGS/STRUCTURES PLA

Dated: 10/11/2018

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

Fratello Construction Corp.

(Name of Contractor or subcontractor)

Vice President/Secretary

(Authorized Officer & Title)Guilio Cianci

134 Milbar Boulevard
Farmingdale, NY 11735

(Address)

631-414-7171 Phone
631-414-7170 Fax

(Phone) (Fax)

Contractor's State License #

Sworn to before me this
11th day of October, 2018

Joan M. Knoblach
Notary Public

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

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.

NYC AGENCY RENOVATION & REHAB CITY OWNED BUILDINGS/STRUCTURES PLA

BUILDSAFENYC

Codes of Conduct

BuildSafeNYC establishes that all BTEA member companies and BCTC member unions establish minimum safety standards on all building construction projects in NYC as follows:

1. The workforce shall adhere to the minimum personal protective equipment (PPE) usage to include:
   a. ANSI compliant Hard Hats (with ratchet suspension) at all times (supplied by employer)
   b. Construction-type Work Boots at all times
   c. Long Pants and shirts with at least short sleeves at all times (no shorts or tank tops)
   d. ANSI compliant Eye Protection in their possession and used as needed (supplied by employer)
   e. Adequate Hearing Protection in their possession and used as needed (supplied by employer)
   f. High-vis traffic vests at street level and when around heavy equipment (supplied by employer)
2. CM and Subcontractor management shall implement a fair and consistent disciplinary policy for all site personnel regarding the adherence to site safety rules and requirements. Likewise, a joint labor / management team will periodically assess project wide implementation of these Codes.
3. CM firms shall maintain minimum standards for workforce restroom, hygiene facilities and housekeeping, initially and throughout the duration of the project.
4. All personnel shall adhere to a strict policy against drug and alcohol possession and use on sites and during hours of work.
5. All personnel shall attend a site safety orientation prior to beginning work. Worker certifications of safety training for specific tasks such as fire watch, flagmen, and safety attendant must be verified.
6. No cell phones, portable media devices, radios or other devices that limit hearing and attention shall be used while working on sites.
7. Ground Fault Circuit Interrupters (GFCI) will be used on all power tools and extension cords.
8. Union trade representatives shall participate in a regularly scheduled site safety meeting on all projects regardless of size.
9. Extreme effort shall be made to isolate the public from all construction activity. Specifically, systems shall be put in place to control falling materials and pedestrian exposure. This should be a top priority for the entire project workforce.
10. Workers shall honor security access control systems to establish entry to sites by authorized personnel only, where applicable.
11. Fall protection management shall be a top project priority. Workers shall maintain and use necessary fall protection systems and procedures where appropriate. Engineering controls and work methods which eliminate, guard, or otherwise control fall hazards shall take priority over personal fall arrest system usage.
12. Where hazardous materials are present, projects shall implement efforts to communicate and control potential exposure to the workforce.

With Full Support and Endorsement of:

Louis A. Coletti, President & CEO
Building Trades Employers Association

BTEANYC The Voice of Construction
Building Trades Employers' Association

Edward J. Malloy, President
Building and Construction Trades Council

Construction Management Firms:

Turner Construction

Gotham Construction

Skanska USA Building Inc.

Tishman

Bovis Lend Lease

Plaza Construction

Trade Unions:

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CITY OF NEW YORK

DEPARTMENT OF
DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

INFORMATION FOR BIDDERS

December 2013

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INFORMATION FOR BIDDERS

1. Description and Location of Work

The description and location of the work for which bids are requested are specified in Attachment 1, "Bid Information". Attachment 1 is included in the Bid Booklet.

2. Time and Place for Receipt of Bids

Sealed bids shall be received on or before the date and hour specified in Attachment 1, at which time they will be publicly opened and read aloud in the presence of the Commissioner or his or her representative, and any bidders who may desire to be present.

3. Definitions

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

4. Invitation For Bids and Contract Documents

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

(1) All provisions required by law to be inserted in this Contract, whether actually inserted or not
(2) The Contract Drawings and Specifications
(3) The General Conditions, the General Requirements and the Special Conditions, if any
(4) The Contract
(5) The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and, if used, the Bid Booklet
(6) The Budget Director's Certificate; all Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed with the Work.

(B) For particulars as to this procurement, including quantity and quality of the purchase, extent of the work or labor to be performed, delivery and performance schedule, and any other special instructions, prospective bidders are referred to the Invitation For Bids Documents. A copy of such documents can be obtained at the location set forth in Attachment 1.

(C) Deposit for Copy of Invitation For Bids Documents: Prospective bidders may obtain a copy of the Invitation For Bids Documents by complying with the conditions set forth in the Notice of Solicitation. The deposit must be in the form of a check or money order made payable to the City of New York, and drawn upon a state or national bank or trust company, or a check of such bank or trust company signed by a duly authorized officer thereof.

(D) Return of Invitation For Bids Documents: All Invitation For Bids Documents must be returned to the Department upon request. If the bidder elects not to submit a bid thereunder, the Invitation For Bids Documents shall be returned to the Department, along with a statement that no bid will be submitted.

(E) Return of Deposit: Such deposit will be returned within 30 days after the award of the contract or the rejection of all bids as set forth in the advertisement, provided the Invitation For Bids Documents are returned to the location specified in Attachment 1, in physical condition satisfactory to the Commissioner.

(F) Additional Copies: Additional copies of the Invitation For Bids Documents may be obtained, subject to the conditions set forth in the advertisement for bids.

5. Pre-Bid Conference

A pre-bid conference shall be held as set forth in Attachment 1. Nothing stated at the pre-bid conference shall change the terms or conditions of the Invitation For Bids Documents, unless a change is made by written amendment as provided in Section 9 below. Failure to attend a mandatory pre-bid conference shall constitute grounds for the rejection of the bid.

6. Agency Contact

Any questions or correspondence relating to this bid solicitation shall be addressed to the Agency Contact person specified in Attachment 1.

7. Bidder's Oath

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

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

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

(A) Pre-Bidding (Investigation) Viewing of Site - Bidders must carefully view and examine the site of the proposed work, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions on, about or above the site relating to or affecting in any way the performance of the work to be done under the Contract which were or should have been indicated to a reasonably prudent bidder. To arrange a date for visiting the work site, bidders are to contact the Agency Contact person specified in Attachment 1.

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

9. Examination of Proposed Contract

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

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

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

10. Form of Bid

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

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

11. Irrevocability of Bid

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

12. Acknowledgment of Amendments

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

13. Bid Samples and Descriptive Literature

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

14. Proprietary Information/Trade Secrets

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

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

15. Pre-Opening Modification or Withdrawal of Bids

Bids may be modified or withdrawn by written notice received in the office designated in Attachment 1, before the time and date set for the bid opening. If a bid is withdrawn in accordance with this Section, the bid security, if any, shall be returned to the bidder.

16. Bid Evaluation and Award

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

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

17. Late Bids, Late Withdrawals and Late Modifications

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

18. Withdrawal of Bids.

Except as provided for in Section 15, above, a bidder may not withdraw its bid before the expiration of forty-five (45) days after the date of the opening of bids; thereafter, a bidder may withdraw its bid only in writing and in advance of an actual award. If within sixty (60) days after the execution of the Contract, the Commissioner fails to fix the date for commencement of work by written notice to the bidder, the bidder, at his option, may ask to be relieved of his obligation to perform the work called for by written notice to the Commissioner. If such notice is given to the Commissioner, and the request to withdraw is granted, the bidder waives all claims in connection with this Contract.

19. Mistake in Bids

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

(B) Mistakes Discovered Before Award

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

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

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

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

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

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

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

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

20. Low Tie Bids

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

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

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

21. Rejection of Bids

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

(1) The bidder fails to furnish any of the information required pursuant to Section 24 or 28 hereof; or if
(2) The bidder is determined to be not responsible pursuant to the Procurement Policy Board Rules; or if
(3) The bid is determined to be non-responsive pursuant to the Procurement Policy Board Rules; or if
(4) The bid, in the opinion of the Agency Chief Contracting Officer, contains unbalanced bid prices and is thus non-responsive, unless the bidder can show that the prices are not unbalanced for the probable required quantity of items, or if the imbalance is corrected pursuant to Section 15.

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

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

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

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

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

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

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

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

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

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

23. Affirmative Action and Equal Employment Opportunity

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

24. VENDEX Questionnaires

(A) Requirement: Pursuant to Administrative Code Section 6-116.2 and the PPB Rules, bidders may be obligated to complete and submit VENDEX Questionnaires. Generally, if this bid is $100,000 or more, or if this bid when added to the sum total of all contracts, concessions and franchises the bidder has received from the City and any subcontracts received from City contractors over the past twelve months, equals or exceeds $100,000, Vendex Questionnaires must be completed. If required, Vendex Questionnaires must be completed and submitted before any award of contract may be made or before approval is given for a proposed subcontractor. Non-compliance with these submission requirements may result in the disqualification of the bid, disapproval of a subcontractor, subsequent withdrawal of approval for the use of an approved subcontractor, or the cancellation of the contract after its award.

(B) Submission: Vendex Questionnaires must be submitted directly to the Mayor's Office of Contract Services, ATTN: Vendex, 253 Broadway, 9th Floor, New York, New York 10007. In addition, the bidder must submit a Confirmation of Vendex Compliance to the agency. A form for this confirmation is set forth in the Bid Booklet.

(C) Obtaining Forms: Vendex Questionnaires, as well as detailed instructions, may be obtained at www.nyc.gov/vendex. The bidder may also obtain Vendex forms and instructions by contacting the Agency Chief Contracting Officer or the contact person for this contract.

25. Complaints About the Bid Process

The New York City Comptroller is charged with the audit of contracts in New York City. Any vendor who believes that there has been unfairness, favoritism or impropriety in the bid process should inform the Comptroller, Office of Contract Administration, One Centre Street, Room 835, New York, New York; telephone number (212)669-2797.

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in Attachment 1. The bid security shall assure the City of New York of the adherence of the bidder to its proposal, the execution of the Contract, and the furnishing of Performance and Payment Bonds by the bidder, if required in Attachment 1. Bid security shall be returned to the bidder as follows:

(1) Within ten (10) days after the bid opening, the Comptroller will be notified to return the deposits of all but the three (3) lowest bidders. Within five (5) days after the award, the Comptroller will be notified to return the deposits of the remaining two unsuccessful bidders.
(2) Within five (5) days after the execution of the Contract and acceptance of the Contractor's bonds, the Comptroller will be notified to return the bid security of the successful bidder or, if performance and payment bonds are not required, only after the sum retained under Article 21 of the Contract equals the amount of the bid security.
(3) Where all bids are rejected, the Comptroller will be notified to return the deposit of the three (3) lowest bidders at the time of rejection.

(B) Performance and Payment Security: Performance and Payment Security must be provided in an amount and type specified in Attachment 1. The performance and payment security shall be delivered by the contractor prior to or at the time of execution of the Contract. If a contractor fails to deliver the required performance and payment security, its bid security shall be enforced, and an award of Contract may be made to the next lowest responsible and responsive bidder, or the contract may be rebid.

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

(1) a one-time bond in a form satisfactory to the City;
(2) a bank certified check or money order;
(3) obligations of the City of New York; or
(4) other financial instruments as determined by the Office of Construction in consultation with the Comptroller.

Whenever the successful bidder deposits obligations of the City of New York as performance and payment security, the Comptroller may sell and use the proceeds thereof for any purpose for which the principal or surety on such bond would be liable under the terms of the Contract. If the money is deposited with the Comptroller, the successful bidder shall not be entitled to receive interest on such money from the City.

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

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

The Department of the Treasury of the United States advises that information concerning approved surety companies may be obtained as follows: (1) from the Government Printing Office at 202-512-1800; (2) through the Internet at http://www.fms.treas.gov/c570/index.html, and (3) through a computerized public bulletin board, which can be accessed by using your computer modem and dialing 202-874-6887.

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

27. Failure to Execute Contract

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

28. Bidder Responsibilities and Qualifications

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

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

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

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

29. Employment Report

In accordance with Executive Order No. 50 (1980) as modified by Executive Order 108 (1986), the filing of a completed Employment Report (ER) is a requirement of doing business with the City of New York for construction contractors with contracts of $1,000,000 or more and subcontractors with construction subcontracts of $750,000 or more. The required forms and information are included in the Bid Booklet.

30. Labor Law Requirements

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

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

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

31. Insurance

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

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

32. Lump Sum Contracts

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

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

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

33. Unit Price Contracts

(A) Comparison of Bids: Bids on Unit Price Contracts will be compared on the basis of a total estimated price, arrived at by taking the sum of the estimated quantities of such items, in accordance with the Engineer's Estimate of Quantities set forth in the Bid Form, multiplied by the corresponding unit prices, and including any lump sum bids on individual items.

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

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

34. Excise Tax

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

35. Licenses and Permits

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

36. Multiple Prime Contractors

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

37. Locally Based Enterprise Requirements (LBE)

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

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

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

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

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

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

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

(a) the name and address of each LBE that will be given a subcontract,
(b) the percentage, dollar amount and type of work to be subcontracted to the LBE, and
(c) the dates when the LBE subcontract work will commence and end.

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

(a) verification letters from each subcontractor listed in the "LBE Participation Schedule" stating that the LBE will enter into a formal agreement for work,
(b) certification documents of any proposed LBE subcontractor which is not on the LBE certified list, and
(c) copies of the certification letter of any proposed subcontractor which is an LBE.

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

(a) attendance at prebid meetings, when scheduled by the agency, to advise bidders of contract requirements;
(b) advertisement where appropriate in general circulation media, trade association publications and small business media of the specific subcontracts that would be at least equal to the percentage goal for LBE utilization specified by the contractor;
(c) written notification to association of small, minority and women contractors soliciting specific subcontractors;
(d) written notification by certified mail to LBE firms that their interest in the contract is solicited for specific work items and their estimated values;
(e) demonstration of efforts made to select portions of the work for performance by LBE firms in order to increase the likelihood of achieving the stated goal;
(f) documented efforts to negotiate with LBE firms for specific subcontracts, including at a minimum:
(i) The names, address and telephone numbers of LBE firms that are contacted;
(ii) A description of the information provided to LBE firms regarding the plans and specifications for portions of the work to be performed;
(iii) Documentation showing that no reasonable price can be obtained from LBE firms;
(iv) A statement of why agreements with LBE firms were not reached;
(g) a statement of the reason for rejecting any LBE firm which the contractor deemed to be unqualified; and
(h) documentation of efforts made to assist the LBE firms contacted that needed assistance in obtaining required insurance.

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

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

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

38. Bid Submission Requirements

The Bid Submission Requirements are set forth on page 2 of the Bid Booklet.

39. Comptroller's Certificate

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

40. Procurement Policy Board Rules

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

41. DDC Safety Requirements

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

CITY OF NEW YORK

DEPARTMENT OF DESIGN AND CONSTRUCTION

SAFETY REQUIREMENTS

June 2015

THE DDC SAFETY REQUIREMENTS INCLUDE THE FOLLOWING SECTIONS:

I. POLICY ON SITE SAFETY

II. PURPOSE

III. DEFINITIONS

IV. RESPONSIBILITIES

V. SAFETY QUESTIONNAIRE

VI. SAFETY PROGRAM AND SITE SAFETY PLAN

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

VIII. EVALUATION DURING WORK IN PROGRESS

IX. SAFETY PERFORMANCE EVALUATION

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I. POLICY ON SITE SAFETY

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

- U. S. Department of Labor 29 Code of Federal Regulations (CFR) Part 1926 and applicable Sub-parts of Part 1910 – U.S. Occupational Safety and Health Administration (OSHA); New York State Department of Labor Industrial Code Rule 23 – Protection in Construction, Demolition and Excavation;
- New York City Construction Codes, Title 28
- NYC Department of Transportation Title 34 Chapter 2 – Highway Rules
- New York State Department of Labor Industrial Code Rule 16 NYCRR Part 753
- Title 15 of the Rules of the City of New York, Chapter 13 Citywide Construction Dust Mitigation
- Manual on Uniform Traffic Control Devices (MUTCD)
- Title 15 of the Rules of the City of New York, Chapter 28 Citywide Construction Noise Mitigation

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 hazard, through a planning, inspection, auditing and corrective action process. The goal is to control risks so that injuries, illnesses and accidents to contractors' employees, DDC employees and the general public, as well as damage to city-owned and private property, are reduced to the lowest level feasible.

III. DEFINITIONS

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

Competent Person: As defined by OSHA, an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees or the general public, and who has authorization to take prompt corrective measures to eliminate them.

Construction Safety Auditor: A representative of the QA&CS Construction Safety Unit who provides inspection and assessment services to enhance health and safety on all DDC construction projects. The activities of the Construction Safety Auditor include performing site surveys, reviewing health and safety plans, reviewing construction permits, and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

Construction Safety Unit: A part of QA&CS within the Division of Program Management/ Safety & Site Support that assesses contractor safety on DDC jobsites and advises responsible parties of needed corrective actions.

Construction Superintendent: A representative of the contractor responsible for overseeing performance of the required construction work. This individual must engage in sound construction practices, and is responsible to maintain a safe work site. In the case of a project involving the demolition, alteration or new construction of buildings, the Construction Superintendent must be licensed by the NYC Department of Buildings.

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

Daily Safety Job Briefing: Daily jobsite safety meetings, giving to all jobsite personnel by contractor, with the purpose of discussing project specific safety procedures for the scheduled construction work.

Director - Quality Assurance and Construction Safety (QA&CS): Responsible for the operations of the QACS Construction Safety Unit and the DDC Site Safety management programs.

Job Hazard Analysis (JHA): A process of identifying the major job steps and any potential site-specific hazards that may be present during construction and establishing the means and methods to eliminate or control those hazards.

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

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

Project Safety Representative: The designated project safety representative shall have completed an authorized 30 hour OSHA Construction Safety Course and other safety training applicable to Contractor's/subcontractor's project work. Except in instances where a dedicated Project Safety Manager is required, a Project Safety Representative may also function as a superintendent, foreman or crew leader on the Project, but must have sufficient experience and authority to undertake corrective actions and must qualify to be a competent person. No work is to be performed on site when a Project Safety Representative is not present.

Project Safety Manager: A dedicated, full-time project safety manager may be a contractual requirement on large projects or projects deemed by DDC to be particularly high risk. This would be in addition or in lieu of a Contractor's Project Safety Representative. This individual shall not have any other assigned duties. This individual shall have received, at a minimum an authorized 30 hour OSHA Construction Safety Course. Other examples of acceptable training are OSHA Safety and Health Standards for the Construction Industry training program (OSHA 510), Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH) or a degree/certificate in a safety and health from a college-level curriculum.
A Project Safety Manager shall possess the additional training, years of experience, and skills necessary to thoroughly understand the health and safety hazards and controls for large construction projects, including the full scope of the specific Work.

QA&CS – Quality Assurance and Construction Safety of the New York City Department of Design and Construction.

Resident Engineer (RE) / Construction Project Manager (CPM): Representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the work. (The RE/CPM may be a third-party consultant, including a Construction Management firm, retained by DDC)

Safety Program: Established by the Contractor that covers all operations of that Contractor and establishes the Contractor's overall safety policy, regulatory compliance plan and minimum safety standards. The Safety Program must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

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

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

Site Safety Plan: A site-specific safety plan developed by the Contractor for a specific project. The Site Safety Plan must identify hazards associated with the project, and include specific safety procedures and training appropriate and

necessary to complete the work. The Site Safety Plan must be submitted prior to the commencement of work at the site and is subject to review and acceptance by the Construction Safety Unit.

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

Weekly Safety Meetings: Weekly documented jobsite safety meetings, given to all jobsite personnel by contractor, with the purpose of discussing general safety topics and job specific requirements encountered at the DDC work site.

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

IV. RESPONSIBILITIES

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

A. DDC or CM Resident Engineer / Construction Project Manager

- Monitors the issuance of safety- related permits, approvals and drawings and maintains copies on site.
- Monitors construction-related work activities to confirm that they are conducted in accordance with DDC policies and all applicable regulations that pertain to construction safety.
- Maintains documentation and periodically attends weekly safety meetings and daily safety job briefings.
- Notifies the Construction Safety Unit and the ACCO's Insurance and Risk Management Unit of project- related accidents and emergencies, as per DDC's Construction Safety Emergency and Accident Notification and Response Protocol.
- Gathers facts related to all accidents and prepares DDC Construction Accident Report.
- Notifies the Construction Safety Unit within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others and forwards a copy of the inspection report within three days of its receipt.
- Monitors the conditions at the site for conformance with the contractor's Site Safety Plan and DDC construction documents.
- Notifies the contractor and DDC in the event that any condition or activity exists that is not in compliance with the contractor's Site Safety Plan, applicable federal, state or local codes or any condition that presents a potential risk of injury to the public or workers or possible damage to property.
- Notifies DDC of any unsafe or unhealthy condition and directs the contractor to provide such labor, materials, equipment and supervision to abate such conditions.
- Escort and assist QA&CS Construction Safety Auditors during the field and record inspections.
- Reports emergency conditions to the Construction Safety Unit immediately.

B. Contractors

- Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
- Complete a written Job Hazard Analysis (JHA) that identifies safety hazards for project specific work tasks and hazard control methods. A written JHA shall be available at the site for reference and included in the Site Safety Plan submitted by the contractor.
- Submit a Site Safety Plan and Safety Program within 30 days from the Award Date or as otherwise directed. The Site Safety Plan and Safety Program are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. The Site Safety Plan shall be revised and updated as necessary.

- Develop project specific safety procedures to protect general public during all construction activities for the duration of the project.
- Ensure that all employees are aware of the hazards associated with the project through documented formal and informal training and/or other communications. Conduct and document weekly safety meetings and daily job briefing sessions for the duration of the project. Documentation to be provided to the RE/CPM on a monthly basis.
- Name the Project Safety Representative and Project Safety Manager, if required. The Contractor will be required to identify the Project Safety Representative and Project Safety Manager in the Site Safety Plan. Resumes, outlining the qualification and experience for the Project Safety Representative and Project Safety Manager, shall be available upon request. DDC reserves the right to request that the Contractor replace any Project Safety Representative or Project Safety Manager for any reason at any time during the project.
- Name a Competent Person(s), The Contractor will be required to identify a Competent Person(s) in the Site Safety Plan.
- Comply with all mandated federal, state and local safety and health rules and regulations.
- Comply with all provisions of the Site Safety Plan.
- Conduct applicable safety training prior to the commencement of work at the site. All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space entry, etc.) shall be provided to the RE/CPM prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review. Prior to performing any work on DDC project all employees shall have successfully completed, within the previous five calendar years, a 10 Hour OSHA construction safety course.
- As part of the Site Safety Plan, prepare a site specific programs and plans, such as MPT plan, steel erection plan, confined space program, fall protection plan, demolition plan, etc. (if not otherwise provided in the contract documents) and comply with all of its provisions.
- Conduct and document site-specific safety orientation for Contractor personnel to review the hazards associated with the project as identified in the Site Safety Plan and the specific safety procedures and controls that will be used to protect workers, the general public and property. The Project Safety Representative and/or Project Safety Manager will conduct this training prior to mobilization and provide documentation to the RE/CPM.
- Provide, replace and adequately maintain at or around the project site, suitable and sufficient signage, lights, barricades and enclosures (fences, sidewalk sheds, netting, bracing, etc.).
- Report unsafe or unhealthy conditions to the RE/CPM as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions.
- Report any accidents involving injuries to workers or the general public, as well as property damage, to the RE/CPM within one (1) hour.
- Following an accident, the Contractor shall not remove or alter any equipment, structure, material, or evidence related to the accident. Exception: Immediate emergency procedures taken to secure structures, temporary construction, operations, or equipment that pose a continued imminent danger or facilitate assistance for persons who are trapped or who have sustained bodily injury.
- Notify the RE/CPM within one (1) hour of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB or others.
- Maintain all records pertaining to all required compliance documents and accident and injury reports.
- Address DDC recommendations on safety, which shall in no way relieve the Contractor of its responsibilities for safety on the project. The Contractor has sole responsibility for safety.

V. SAFETY QUESTIONNAIRE

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

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

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

If the Contractor fails to meet the basic criteria listed above, the Construction Safety Unit may request, through the ACCO, more details concerning the Contractor's safety experience. DDC may request the Contractor to provide copies of, among other things, accident investigation reports, OSHA records, OSHA and NYC DOB citations, EPA citations and written corrective action plan.

VI. SAFETY PROGRAM AND SITE SAFETY PLAN

Within thirty (30) days from the Award Date, or as otherwise directed, the Contractor shall submit the following: (1) Safety Program, and (2) Site Safety Plan. The Safety Program shall set forth the Contractor's overall safety policy, regulatory compliance plan and minimum safety standards. The Site Safety Plan shall identify project work scope, safety hazards associated with the project tasks, and include specific safety procedures and training appropriate and necessary to complete the work. The Safety Program and the Site Safety Plan are subject to review and acceptance by the Construction Safety Unit prior to the commencement of work at the site. Failure by the Contractor to submit an acceptable Site Safety Plan and Safety Program shall be grounds for default.

Safety Program: Corporate Safety Program established by the Contractor that includes the Contractor's overall safety policy, regulatory compliance plan and basic safety procedures covering all aspects of construction operations, performed by the Contractor. The Safety Program shall be a written document with a separate section describing each element of the Safety Program. The Safety Program shall have at minimum the following elements applicable to the Contractor's operations:

- Responsibility and Organization – Contractor's company organization chart, including titles, names, contact information, roles and responsibilities for key personnel, etc.
- Safety Training Program – Contractor's corporate training program.
- Hazard Corrective Actions – Criteria for safety inspections, identification of safety non-compliances, implementation and verification of corrective actions, forms to document safety inspections results, etc.
- Accident/Exposure Investigation
- Recordkeeping and Reporting Injuries – Responsible staff; reporting and recording criteria; OSHA 300 and 300A form completion, etc.
- Fire Protection and Prevention Program
- Housekeeping
- Illumination
- Sanitation
- Personal Protective Equipment (PPE) – Company policy for the use of head protection, foot protection, hearing protection, eye and face protection, protective clothing, and any additional protective equipment based on work tasks; PPE inspection and replacement policy.
- Hazard Communication Program
- Employee Emergency Action Plan
- Protection of Underground Facilities and Utilities
- Ionizing/Nonionizing Radiation
- Material Handling, Storage, Use and Disposal
- Tools – Hand and Power
- Signs, Signals, and Barricades

- Scaffold – Local Law 52 requirements, installation, use, inspection, dismantling, training and general safety requirements.
- Welding and Cutting
- Electrical Safety
- Fall Protection
- Cranes, Derrick, Hoists, Elevators, Conveyors
- Excavation Safety
- Concrete and Masonry Construction
- Maintenance and Protection of Traffic
- Steel Erection
- Demolition
- Blasting and the Use of Explosives
- Stairways and Ladders
- Toxic and Hazardous Substances
- Alcohol and Drug Abuse Policy
- Rodents and Vermin
- Occupational Noise Exposure
- Confined Space Program – General confined Space Program: training requirements, confined space hazard evaluation procedure, atmospheric testing procedure, confined space classification, permit-required procedure, communication procedure, rescue procedure, forms, etc.
- Construction Vehicles/Heavy Equipment
- Dust Control Procedures

Site Safety Plan: The Site Safety Plan shall be a written document and shall apply to all project specific Contractor and subcontractor operations, and shall have at a minimum, the following elements with each element described in a separate section (It may be necessary to modify the basic format for certain unique or high-risk projects, such as tunnels or high-rise construction):

- Project Work Scope – Detailed information regarding work tasks that will be performed by contractor and subcontractors under the project.
- Responsibility and Organization – Contractor's organization chart with responsible staff for the project, including titles, names, contact information, roles and responsibilities.
- Safety Training and Education – OSHA 10 Hours training, requirements for daily safety briefings and weekly safety meetings, any work task specific training, responsible staff for implementation of training program for the project.
- Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE), contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
- Protection of Public
- Hazard Corrective Actions – Responsible staff, forms, frequency of safety inspections and implementation of corrective actions.
- Accident/Exposure Investigation – Accident/incident notification procedure of DDC project staff. Project specific procedures for accident investigation and implementation of corrective actions.
- First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
- Project Specific Fire Protection and Prevention Program.
- Project Specific Illumination Procedure.
- Project Specific Sanitation Procedure.
- Personal Protective Equipment (PPE)
- Hazard Communication Program – Responsible staff; training; SDS records, project specific list of chemical; location of the program and SDS records.
- Means of Egress – Information regarding free and unobstructed egress from all parts of the building or structure; exit marking; maintenance of means of egress, etc.
- Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system, evacuation procedure, procedure to account for employees after evacuation, etc.
- Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.

- Protection of Underground Facilities and Utilities, including responsible staff.
- Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employees exposure and protection, etc.
- Material Handling, Storage, Use and Disposal – Project specific information regarding material storage and disposal.
- Signs, Signals, and Barricades – Use of danger/warning signs, sidewalk closure, safety instruction signs, pedestrian fencing and barricades, etc.
- Scaffold – Project specific scaffold types, training, scaffold drawings, competent person, criteria for project specific scaffold, falling object protection.
- Welding and Cutting – project specific procedure for welding and cutting, including all necessary safety requirements such as fire prevention, personal protective equipment, hot work permits, FDNY certificate requirements.
- Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan.
- Cranes, Derrick, Hoists, Elevators, Conveyors – project specific equipment information including type, rated load capacity, manufacture specification requirements, competent person, exposure to falling load, inspection, recordkeeping, clearance requirements, communication procedure, ground lines, permits.
- Excavation Safety – Competent person, project specific protective system.
- Maintenance and Protection of Traffic Plan – Project specific MPT plan, flagmen training.
- Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person.
- Demolition – Engineering survey, including written evidence, disconnection of all effected utilities, identification of all hazardous chemicals, materials, gases, etc., floor openings, chutes, inspection and maintenance of all stairs/passageways, removal of materials/debris/structural elements, lock out/tag out, competent person.
- Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
- Toxic and Hazardous Substances – Safety procedures for substances to be used on project.
- Noise Mitigation Plan – Completed project specific Noise Mitigation Plan.
- Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
- Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site.
- Dust Mitigation Plan – Completed project specific Dust Mitigation Plan.

The most critical component of the Site Safety Plan is the Job Hazard Analysis (JHA) section. The JHA form is a written document prepared by the contractor. The contractor must conduct a site and task assessment JHA to identify the major job steps and any potential safety or environmental hazards related to performance of the work, eliminate or implement controls for the potential hazards, and identify proper personal protective equipment for the task. The JHA shall be communicated to all contractor/subcontractor personnel on site.
The initial Job Hazard Assessment form shall be included in the contractor's Site Safety Plan and the current form shall be available at the construction site for reference.

Certain DDC programs, such as Job Order Contracting System (JOCS), may not necessarily require Site Safety Plans. The JOCS contractor shall submit a Safety Program. The Site Safety Plan requirement for the JOCS contractor will be determined by QA&CS based on a project work scope, construction activities and project location. In addition, certain DDC Operating Units may establish client-specific program or safety requirements. The contractor's Site Safety Plan must address such client-specific program or safety requirements.

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

RE/CPM shall invite QA&CS Construction Safety Unit to the construction kick-off meeting. A QA&CS representative will participate in this meeting with the Contractor and RE/CPM prior to the start of the project for the purpose of:

A. Reviewing the safety issues detailed in the contract.
B. Reviewing the Site Safety Plan.
C. Reviewing any new issues or information that was not previously addressed.
D. Discussing planned inspections and audits of the site by QA&CS personnel.

VIII. EVALUATION DURING WORK IN PROGRESS

The Contractor's adherence to these Safety Requirements will be monitored throughout the project. This will be accomplished by the following:

A. Use of a safety checklist by a representative of the Construction Safety Unit or other designated DDC representative or Consultant during regular, unannounced inspections of the job site. Field Exit Conferences will be held with the RE/CPM, Contractor Project Safety Representatives.

B. The RE/CPM will continually monitor the safety and environmental performance of the contractor's employees and work methods. Deficiencies shall be brought to the attention of the contractor's representative on site for immediate correction. The DDC representative will maintain a written record of these deficiencies and have these records available upon request. Any critical deficiencies shall be immediately reported to QA&CS phone# (718) 391-1624 or (718) 391-1911.

C. If the Contractor's safety performance during the project is not up to DDC standards (safety performance measure, accident/incident rate, etc.) the Director – QA&CS, or his/her designee will meet with the Contractor's Project Safety Representative and or Project Safety Manager, the DDC Project Manager, the RE/CPM, and the DDC Environmental Specialist (if environmental issues are involved). The purpose of this meeting is to 1) determine the level of non-compliance; 2) explain and clarify the safety/environmental provisions; 3) agree on a future course of action to correct the deficiencies.

D. If the deficiencies continue to occur with inadequate attention by the contractor, this shall, among other remedies available, be grounds for default.

E. The contractor shall within 1 hour inform the RE/CPM/CM of all accidents/incidents including all fatalities, any injuries to employees or members of the general public, and property damage (e.g., structural damage, equipment rollovers, utility damage, loads dropped from crane). The RE/CPM shall notify the Construction Safety Unit as per DDC's Construction Safety Emergency and Accident Notification and Response Protocol and shall maintain a record of all contractor accidents/incidents for the project.

F. The Construction Safety Unit shall be notified within two (2) hours of the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections.

IX. SAFETY PERFORMANCE EVALUATION

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

CITY OF NEW YORK

STANDARD CONSTRUCTION CONTRACT

March 2017

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CITY OF NEW YORK
STANDARD CONSTRUCTION CONTRACT

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WITNESSETH:

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

CHAPTER I: THE CONTRACT AND DEFINITIONS

ARTICLE 1. THE CONTRACT

1.1 Except for titles, subtitles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience), the following, except for such portions thereof as 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 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.[1] For each **Subcontractor** listed, **Contractor** is required to provide the following information: maximum contract value, description of **Subcontractor's** Work, start and end date of the subcontract and identification of the **Subcontractor**'s industry. Thereafter, **Contractor** will be required to report in the system the payments made to each **Subcontractor** within 30 days of making the 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

[1] In order to use the new system, a PIP account will be required. Detailed instructions on creating a PIP account and using the new system are also available at www.nyc.gov/pip. Additional assistance with PIP may be obtained by emailing the Financial Information Services Agency Help Desk at pip@fisa.nyc.gov.

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.

20.4.2In 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.

26.1.1For 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) x (HP rating) x (Fuel cost/gallon). Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by Equipment Watch (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable), as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment (scaffolding, sheeting systems, road plates, etc.), the **City** may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

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

26.2.6 Necessary fees charged by governmental entities; plus

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 27. RESOLUTION OF DISPUTES

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

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

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

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

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

27.4 Presentation of Disputes to **Commissioner**.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 29. OMITTED WORK

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 31. THE RESIDENT ENGINEER

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

ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER

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

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

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

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

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

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

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

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

ARTICLE 33. THE COMMISSIONER

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

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

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

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

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

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

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

ARTICLE 34. NO ESTOPPEL

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

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

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

CHAPTER VIII: LABOR PROVISIONS

ARTICLE 35. EMPLOYEES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

35.5 Paid Sick Leave Law.

35.5.1 Introduction and General Provisions.

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

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

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

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

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

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

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

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

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

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

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

illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;

iii. closure of such employee's place of business by order of a public official due to a public health emergency; or

iv. such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency.

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

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

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

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

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

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

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

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

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

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

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

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

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

35.5.5 Notice of Rights.

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

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

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

35.5.7 Enforcement and Penalties.

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

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

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

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

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

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

35.6.2 Job Posting Requirements.

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

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

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

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

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

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

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

35.6.4 Audit Compliance. In addition to the auditing requirements set forth in other 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 contraction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable **Law**, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City** Charter.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City** Council shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling 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 asses, identify, and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative 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 in default and/or terminate this **Contract** for cause and procure supplies, services or **Work** from another source in the manner the **Agency** deems proper. In the event of such termination, the **Contractor** shall pay to the **Agency**, or the **Agency** in its sole discretion may withhold from any amounts otherwise payable to the **Contractor**, the difference between the **Contract** price for the uncompleted portion of this **Contract** and the cost to the **Agency** of completing performance of this **Contract** either itself or by engaging another **Contractor** or **Contractors**. In the case of a requirement **Contract**, the **Contractor** shall be liable for such difference in price for the entire amount of supplies required by the **Agency** for the uncompleted term of **Contractor's Contract**. In the case of a construction **Contract**, the **Agency** shall also have the right to hold the **Contractor** in partial or total default in accordance with the default provisions of this **Contract**, and/or may seek debarment or suspension of the **Contractor**. The rights and remedies of the **Agency** hereunder shall be in addition to, and not in lieu of, any rights and remedies the **Agency** has pursuant to this **Contract** or by operation of **Law**.

ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB

70.1 The **Contractor** shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the **City** Department of Buildings Web site at www.nyc.gov/buildings.

ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS

71.1 Tropical hardwoods, as defined in Section 165 of the New York State Finance Law (Finance Law), shall not be utilized in the performance of this **Contract** except as expressly permitted by Section 165 of the Finance Law.

ARTICLE 72. CONFLICTS OF INTEREST

72.1 Section 2604 of the **City** Charter and other related provisions of the **City** Charter, the Administrative Code, and the Penal Law are applicable under the terms of this **Contract** in relation to conflicts of interest and shall be extended to **Subcontractors** authorized to perform **Work**, labor and services pursuant to this **Contract** and further, it shall be the duty and responsibility of the **Contractor** to so inform its respective **Subcontractors**. Notice is hereby given that, under certain circumstances, penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

ARTICLE 73. MERGER CLAUSE

73.1 The written **Contract** herein, contains all the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of this **Contract** shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

ARTICLE 74. STATEMENT OF WORK

74.1 The **Contractor** shall furnish all labor and materials and perform all **Work** in strict accordance with the **Specifications** and **Addenda** thereto, numbered as shown in Schedule A.

ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR

75.1 The **City** will pay and the **Contractor** will accept in full consideration for the performance of the **Contract**, subject to additions and deductions as provided herein, the total sum shown in Schedule A, this said sum being the amount at which the **Contract** was awarded to the **Contractor** at a public letting thereof, based upon the **Contractor's** bid for the **Contract**.

ARTICLE 76. ELECTRONIC FUNDS TRANSFER

76.1 In accordance with Section 6-107.1 of the Administrative Code, the **Contractor** agrees to accept payments under this **Contract** from the **City** by electronic funds transfer (EFT). An EFT is any

transfer of funds, other than a transaction originated by check, draft or similar paper instrument, which is initiated through an electronic terminal, telephonic instrument or computer or magnetic tape so as to order, instruct or authorize a financial institution to debit or credit an account. Prior to the first payment made under this **Contract**, the **Contractor** shall designate one financial institution or other authorized payment agent and shall complete the attached "EFT Vendor Payment Enrollment Form" in order to provide the Commissioner of the **City** Department of Finance with information necessary for the **Contractor** to receive electronic funds transfer payments through a designated financial institution or authorized payment agent. The crediting of the amount of a payment to the appropriate account on the books of a financial institution or other authorized payment agent designated by the **Contractor** shall constitute full satisfaction by the **City** for the amount of the payment under this **Contract**. The account information supplied by the **Contractor** to facilitate the electronic funds transfer shall remain confidential to the fullest extent provided by **Law**.

76.2 The **Commissioner** may waive the application of the requirements of this Article 76 to payments on contracts entered into pursuant to Section 315 of the **City** Charter. In addition, the Commissioner of the Department of Finance and the Comptroller may jointly issue standards pursuant to which the **Agency** may waive the requirements of this Article 76 for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications or types of checks; or (iii) in other circumstances as may be necessary in the interest of the **City**.

ARTICLE 77. RECORDS RETENTION

77.1 The **Contractor** agrees to retain all books, records, and other documents relevant to this **Contract** for six years after the final payment or termination of this **Contract**, whichever is later. **City**, state, and federal auditors and any other persons duly authorized by the **City** shall have full access to and the right to examine any such books, records, and other documents during the retention period.

ARTICLE 78. EXAMINATION AND VIEWING OF SITE, CONSIDERATION OF OTHER SOURCES OF INFORMATION AND CHANGED SITE CONDITIONS

78.1 Pre-Bidding (Investigation) Viewing of Site – Bidders must carefully view and examine the **Site** of the proposed **Work**, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions and hazards on, about or above the **Site** relating to or affecting in any way the performance of the **Work** to be done under the **Contract** that were or should have been known by a reasonably prudent bidder. To arrange a date for visiting the **Site**, bidders are to contact the **Agency** contact person specified in the bid documents.

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

ARTICLE 79. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT

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, by emailing DSBS at 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, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

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

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

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

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

(b) To apply for a full or partial waiver of the **Participation Goals**, a bidder, proposer, or contractor, as applicable, must complete Part 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 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: _____
Commissioner

CONTRACTOR: FRATELLO CONSTRUCTION CORP.

By: _____
(Member of Firm or Officer of Corporation)

Title: _____

(Where Contractor is a Corporation, add):
Attest:

_____
Secretary

(Seal)

_____

ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Queens ss:

On this 5th day of DEC, 2016 before me personally came Guilio Cianci to me known who, being by me duly sworn did depose and say that he resides at FARMINGDALE, NY 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.

MARIA JOHNSTON
Notary Public, State of New York
No. 01JO6351081
Qualified in Queens County
Commission Expires Nov. 28, 2019

Notary Public or Commissioner of Deeds

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 New York County of Queens ss:

On this 12th day of Dec., 2018, before me personally came Lorraine Grillo to me known, and known to be the 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 Commissioner for the purposes therein mentioned.

Notary Public or Commissioner of Deeds

MARIA JOHNSTON
Notary Public, State of New York
No. 01JO6351081
Qualified in Queens County
Commission Expires Nov. 28, 2020

AUTHORITY

MAYOR'S CERTIFICATE NO. CBX DATED
BUDGET DIRECTOR'S CERTIFICATE NO. 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

Nine million, six hundred thousand dollars only.

Dollars ($ 9,600,000.00)

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.

Lorraine Grillo
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

KNOW ALL PERSONS BY THESE PRESENTS:,
That we, _____

_____

_____

hereinafter referred to as the "Principal,"
and, _____

_____

_____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum
of _____

_____

_____

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

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

_____

_____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making

good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost to complete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city the cost of completion plus any applicable damages and costs under option (1) above, or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed $100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid for the completion of the Contract as if such sums had not been paid to the Principal, but shall not provide a basis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.

Performance Bond #1 (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.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

_____ day of _____, 20_____.

(Seal)

_____(L.S.)
Principal

By:_____.

(Seal)

Surety

By:_____.
_____.

(Seal)

Surety

By:_____.
_____.

(Seal)

Surety

By:_____.
_____.

(Seal)

Surety

By:_____.
_____.

(Seal)

Surety

By:_____.

Bond Premium Rate _____.

Bond Premium Cost _____.

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

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by 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.

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 dispose and say that he/she resides at _____
_____; that he/she is _____ partner of
_____, a limited/general partnership existing under the laws of the State of
_____, the partnership described in and which executed the foregoing instrument;
and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, 20_____ before me personally came _____,
to me known, who,.being by me duly sworn did depose and say that he/she resides at _____
_____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

Bond No. 12BCSHU8414

Performance Bond #2 (Pages 104 to 107): Use if the total contract price is more than $5 Million.

PERFORMANCE BOND #2

KNOW ALL PERSONS BY THESE PRESENTS:,
That we, Fratello Construction Corp.

134 Milbar Blvd., Farmingdale, NY 11735

hereinafter referred to as the "Principal,"
and, Hartford Fire Insurance Company

One Hartford Plaza , Hartford, CT 06155-0001

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 Nine Million Six Hundred Thousand Dollars and 00/100

($ 9,600,000.00) Dollars, lawful money of the United States for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

Renovation of the Newtown Creek Nature Walk, Phase 3- FMS ID# NC-61A, DDC PIN #8502018CT0002C,E-PIN #85018B0124001, Boro of Brooklyn, NY

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.

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.

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 28th day of November, 2018.

(Seal) Fratello Construction Corp. (L.S.)
Principal
By: Guilio Cianci
Guilio Cianci, Vice President

(Seal) Hartford Fire Insurance Company
Surety
By: Deborah L. Severin
Deborah L. Severin, Attorney-in-Fact

(Seal) _____
Surety
By: _____

(Seal) _____
Surety
By: _____

(Seal) _____
Surety
By: _____

(Seal) _____
Surety
By: _____

Bond Premium Rate _____.
Bond Premium Cost _____.

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

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by 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.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of New York County of Nassau ss:

On this 28th day of November, 2018 before me personally came Guilio Cianci,
to me known, who,.being by me duly sworn did depose and say that he/she resides at 14 Tideway Lane, East Northport, NY, that he/she is the Vice President of the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

Joan M. Knoblach
Notary Public or Commissioner of Deeds

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, _____ before me personally came _____,
to me known, who,.being by me duly sworn did depose and say that he/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 _____, _____ before me personally came _____,
to me known, who,.being by me duly sworn did depose and say that he/she resides at _____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK }
COUNTY OF NASSAU } ss:

On November 28, 2018 before me personally came Deborah L. Severin to me known who, being by me duly sworn, did depose and say that he/she resides at 255 Executive Drive, Plainview, New York 11803, that he/she is the Attorney-In-Fact of Hartford Fire Insurance Company the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name thereto by order of the Board of Directors of said corporation.

ROSANNE CALLAHAN
Notary Public, State of New York
No. 01CA6024444
Qualified in SUFFOLK County
Commission Expires May 10, 20 19

Notary Public

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-12
One Hartford Plaza
Hartford, Connecticut 06155
Bond.Claims@thehartford.com
call: **888-266-3488** *or fax:* **860-757-5835**

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Agency Name: SGH ASSOCIATES INC
Agency Code: 12-128095

- [X] **Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [X] **Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of*** Unlimited :

Janice Fiscina, Rosanne Callahan, Robert Finnell, Peter Henry, Jennifer Johnston, Fern Perry, Deborah L. Severin of PLAINVIEW, New York

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on May 6, 2015 the Companies have caused these presents to be signed by its Senior Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

John Gray, Assistant Secretary

M. Ross Fisher, Senior Vice President

STATE OF CONNECTICUT } ss. Hartford
COUNTY OF HARTFORD

On this 5th day of January, 2018, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Senior Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

Kathleen T. Maynard
Notary Public
My Commission Expires July 31, 2021

CERTIFICATE

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of
Signed and sealed at the City of Hartford.

NOV 28 2018

Kevin Heckman, Assistant Vice President

HARTFORD FIRE INSURANCE COMPANY

Hartford, Connecticut

Financial Statement, June 30, 2017

Statutory Basis

ASSETS

U.S. Government Bonds	$	607,225,948
Bonds of Other Governments		134,069,801
State, County Municipal		
Miscellaneous Bonds		5,782,757,431
Stocks		5,976,423,366
Short Term Investments		462,290,574
	$	**12,962,767,120**
Real Estate	$	335,148,217
Cash		45,564,542
Agents' Balances (Under 90 Day)		3,037,980,240
Other Invested Assets		6,431,049,108
Miscellaneous		2,996,427,081
Total Admitted Assets	$	**25,808,936,308**

LIABILITIES

Reserve for Claims and Claim Expense		$	7,905,274,972
Reserve for Unearned Premiums			2,154,900,357
Reserve for Taxes, License and Fees			61,378,282
Miscellaneous Liabilities			2,880,489,103
Total Liabilities		$	**13,002,042,714**
Capital Paid In	$ 55,320,000		
Surplus	12,751,573,594		
Surplus as regards Policyholders		$	**12,806,893,594**
Total Liabilities, Capital and Surplus		$	**25,808,936,308**

STATE OF CONNECTICUT
COUNTY OF HARTFORD } SS.
CITY OF HARTFORD

Michael R. Hazel, Vice President and Controller, and Allen R. Craig, Assistant Secretary of the Hartford Fire Insurance Company, being duly sworn, each deposes and say that the foregoing is a true and correct statement of the said company's financial condition as of June 30, 2017.

Subscribed and sworn to before me
this 19th day of September, 2017.

Vice President and Controller

Notary Public

Assistant Secretary

JOANNE V FARRELL
Notary Public, State of Connecticut
My Commission Expires Dec. 31, 2020

Form CS-19-37 HF printed in U.S.A.

Bond No. 12BCSHU8414

Payment Bond (Pages 108 to 111): Use for any contract for which a Payment Bond is required.

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, Fratello Construction Corp. 134 Milbar Blvd., Farmingdale, NY 11735

hereinafter referred to as the "Principal", and Hartford Fire Insurance Company One Hartford Plaza , Hartford, CT 06155-0001

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

Nine Million Six Hundred Thousand Dollars and 00/100

($ 9,600,000.00) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for Renovation of the Newtown Creek Nature Walk, Phase 3- FMS ID# NC-61A, DDC PIN #8502018CT0002C,E-PIN #85018B0124001, Boro of Brooklyn, NY

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.

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.

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 28th day of November, 2018.

(Seal) Fratello Construction Corp. (L.S.)
Principal
By: Guilio Cianci, Vice President

(Seal) Hartford Fire Insurance Company
Surety
By: Deborah L. Severin
Deborah L. Severin, 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.

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of New York County of Nassau ss:

On this 28th day of November, 2018, before me personally came Guilio Cianci to me known, who, being by me duly sworn did depose and say that he resides at 14 Tideway Lane, East Northport, NY 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.

Joan M. Knoblach
Notary Public or Commissioner of Deeds

JOAN M. KNOBLACH
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01KN4815346
Qualified in Nassau County
Commission Expires 1/31/2019

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____ County of _____ ss:

On this _____ day of _____, _____, before me personally appeared _____ to me known, and known to me to be one of the members of the firm of _____ _____ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____ County of _____ ss:

On this _____ day of _____, _____, before me personally appeared _____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY

STATE OF NEW YORK }
COUNTY OF NASSAU } ss:

On November 28, 2018 before me personally came Deborah L. Severin to me known who, being by me duly sworn, did depose and say that he/she resides at 255 Executive Drive, Plainview, New York 11803, that he/she is the Attorney-In-Fact of Hartford Fire Insurance Company the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name thereto by order of the Board of Directors of said corporation.

ROSANNE CALLAHAN
Notary Public, State of New York
No. 01CA6024444
Qualified In SUFFOLK County
Commission Expires May 10, 20 19

Notary Public

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-12
One Hartford Plaza
Hartford, Connecticut 06155
Bond.Claims@thehartford.com
call: **888-266-3488** *or fax:* **860-757-5835**

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Agency Name: SGH ASSOCIATES INC
Agency Code: 12-128095

- [X] **Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [X] **Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of*** Unlimited :

Janice Fiscina, Rosanne Callahan, Robert Finnell, Peter Henry, Jennifer Johnston, Fern Perry, Deborah L. Severin of PLAINVIEW, New York

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on May 6, 2015 the Companies have caused these presents to be signed by its Senior Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

John Gray, Assistant Secretary

M. Ross Fisher, Senior Vice President

STATE OF CONNECTICUT
COUNTY OF HARTFORD } ss. Hartford

On this 5th day of January, 2018, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Senior Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

Kathleen T. Maynard
Notary Public
My Commission Expires July 31, 2021

CERTIFICATE

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of

Signed and sealed at the City of Hartford.

NOV 28 2018

Kevin Heckman, Assistant Vice President

HARTFORD FIRE INSURANCE COMPANY

Hartford, Connecticut

Financial Statement, June 30, 2017

Statutory Basis

ASSETS

U.S. Government Bonds	$	607,225,948
Bonds of Other Governments		134,069,801
State, County Municipal		
Miscellaneous Bonds		5,782,757,431
Stocks		5,976,423,366
Short Term Investments		462,290,574
	$	**12,962,767,120**
Real Estate	$	335,148,217
Cash		45,564,542
Agents' Balances (Under 90 Day)		3,037,980,240
Other Invested Assets		6,431,049,108
Miscellaneous		2,996,427,081
Total Admitted Assets	$	**25,808,936,308**

LIABILITIES

Reserve for Claims and Claim Expense			$ 7,905,274,972
Reserve for Unearned Premiums			2,154,900,357
Reserve for Taxes, License and Fees			61,378,282
Miscellaneous Liabilities			2,880,489,103
Total Liabilities			$ **13,002,042,714**
Capital Paid In	$	55,320,000	
Surplus		12,751,573,594	
Surplus as regards Policyholders			$ **12,806,893,594**
Total Liabilities, Capital and Surplus			$ **25,808,936,308**

STATE OF CONNECTICUT
COUNTY OF HARTFORD } SS.
CITY OF HARTFORD

Michael R. Hazel, Vice President and Controller, and Allen R. Craig, Assistant Secretary of the Hartford Fire Insurance Company, being duly sworn, each deposes and say that the foregoing is a true and correct statement of the said company's financial condition as of June 30, 2017.

Subscribed and sworn to before me
this 19th day of September, 2017.

Notary Public

JOANNE V FARRELL
Notary Public, State of Connecticut
My Commission Expires Dec. 31, 2020

Vice President and Controller

Assistant Secretary

Form CS-19-37 HF printed in U.S.A.

FRATCON-02 JBRUNO

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 12/04/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Levitt-Fuirst Associates, LTD 520 White Plains Road 2nd Floor Tarrytown, NY 10591	PHONE (A/C, No, Ext): (914) 457-4200	FAX (A/C, No): (914) 457-4200
	E-MAIL ADDRESS: info@levittfuirst.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Travelers Property Casualty Company of America	25674
INSURER B : Travelers Casualty Insurance Company of America	19046
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED

Fratello Construction Corp.
134 Milbar Blvd
Farmingdale, NY 11735

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY							
	CLAIMS-MADE [X] OCCUR			CO-9M210352	12/04/2018	12/04/2019	EACH OCCURRENCE	$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 300,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY [X] PRO-JECT [ ] LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
	OTHER:							$
B	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$ 2,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS			BA1J83638118SEL	04/13/2018	04/13/2019	BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB [X] OCCUR						EACH OCCURRENCE	$ 5,000,000
	EXCESS LIAB [ ] CLAIMS-MADE			CUP-9M216147	12/04/2018	12/04/2019	AGGREGATE	$
	DED [X] RETENTION $ 10,000						Aggregate	$ 5,000,000
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						[ ] PER STATUTE [ ] OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N [ ] (Mandatory in NH)	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
A	Property			QT6604987C965TIL18	01/22/2018	01/22/2019	BPP	200,000

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

RE: Renovation of the Newtown Creek Nature Walk, Phase 3, Brooklyn. FMS ID: NC-61A,
E-PIN: 85018B0124001, DDC PIN: 8502018CT0002C
The following are included as additional insureds when required under written Contract or Agreement: The City of New York, including its officials and employees.

CERTIFICATE HOLDER

NYC Dept. of Design & Construction
ACCO, Attn: Risk Manager Fourth Floor
30-30 Thomson Avenue
Long Island City, NY 11101

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



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NYSIF **New York State Insurance Fund**

Workers' Compensation & Disability Benefits Specialists Since 1914

199 CHURCH STREET, NEW YORK, N.Y. 10007-1100

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

^^^^^^ 112992307
LEVITT-FUIRST ASSOCIATES LTD
520 WHITE PLAINS ROAD, 2ND FL
TARRYTOWN NY 10591

SCAN TO VALIDATE
AND SUBSCRIBE

POLICYHOLDER	CERTIFICATE HOLDER
FRATELLO CONSTRUCTION CORP 134 MILBAR BLVD FARMINGDALE NY 11735	NYC DEPT. OF DESIGN & CONSTRUCTION ACCO, ATTN:RISK MGR.4TH FL,30-30 THOMSON AVE. LONG ISLAND CITY NY 11101

POLICY NUMBER	CERTIFICATE NUMBER	POLICY PERIOD	DATE
G1062 235-5	313707	06/29/2018 TO 06/29/2019	12/4/2018

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 1062 235-5, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP. THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THIS CERTIFICATE DOES NOT APPLY TO THOSE JOB SITES WHICH ARE COVERED BY OTHER INSURANCE AND ARE SPECIFICALLY EXCLUDED BY ENDORSEMENT.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

Sherwin Taylor

DIRECTOR,INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 780665874

U-26.3

NEW YORK STATE | Workers' Compensation Board

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

1a. Legal Name & Address of Insured (use street address only)
FRATELLO CONSTRUCTION CORP

134 MILBAR BOULEVARD
FARMINGDALE, NY 11735

Work Location of Insured *(Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)*

1b. Business Telephone Number of Insured
631-414-7171

1c. Federal Employer Identification Number of Insured or Social Security Number
112992307

2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)
NYC DEPT. OF DESIGN & CONSTRUCTION ACCO
ATTN: RISK MANAGER, FOURTH FLOOR
30-30 THOMSON AVENUE
LONG ISLAND CITY, NY 11101

3a. Name of Insurance Carrier
ShelterPoint Life Insurance Company

3b. Policy Number of Entity Listed in Box "1a"
DBL288633

3c. Policy effective period
01/01/2018 to 12/31/2019

4. Policy provides the following benefits:
- [X] A. Both disability and paid family leave benefits.
- [ ] B. Disability benefits only.
- [ ] C. Paid family leave benefits only.

5. Policy covers:
- [X] A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law.
- [ ] B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 12/4/2018 By Richard O. White
(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.***

DB-120.1 (10-17)

CERTIFICATION BY BROKER

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Liability Insurance is accurate in all material respects

LEVITT-FUIRST ASSOCIATES LTD

[Name of broker or agent (typewritten)]

520 White Plains Road, 2nd Floor
Tarrytown, NY 10591

[Address of broker or agent (typewritten)]

INFO@LEVITTFUIRST.COM

[Email address of broker or agent (typewritten)]

914 - 457 - 4200

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

[Signature of authorized official, broker or agent]

MARC SPAR - BROKER

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

State of NEW YORK)
) ss.:
County of WESTCHESTER)

Sworn to before me this 4 th day of DECEMBER 20 18

NOTARY PUBLIC FOR THE STATE OF NY

ANA M CORONA
Notary Public - State of New York
NO. 01CO6181689
Qualified in Bronx County
My Commission Expires 2-11-2020

(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.

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BOILERMAKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $31.26

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.02

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $34.78

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $36.56

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $38.32

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $40.09

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $41.84

(Local #5)

BRICKLAYER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $18.80

(Bricklayer District Council)

CARPENTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Benefit Rate Per Hour For Building Apprentice: $31.34
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $33.54

Carpenter (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour For Building Apprentice: $31.34
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $33.54

Carpenter (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour For Building Apprentice: $31.34
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $33.54

Carpenter (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour For Building Apprentice: $31.34
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $33.54

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

Carpenter - High Rise (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $17.52
Supplemental Benefit Rate per Hour: $16.20

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $23.95
Supplemental Benefit Rate per Hour: $16.33

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $30.53
Supplemental Benefit Rate per Hour: $16.46

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $38.15
Supplemental Benefit Rate per Hour: $16.61

(Carpenters District Council)

CEMENT MASON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Cement Mason (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Cement Mason (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's Rate

(Local #780)

CEMENT AND CONCRETE WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $17.75

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.03

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $24.30

Cement & Concrete Worker (Hired after 2/6/2016 - First 1334 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: $16.96
Supplemental Benefit Rate Per Hour: $11.80

Cement & Concrete Worker (Hired after 2/6/2016 - Second 1334 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: $22.08
Supplemental Benefit Rate Per Hour: $16.49

Cement & Concrete Worker (Hired after 2/6/2016 - Last 1334 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: $27.20
Supplemental Benefit Rate Per Hour: $17.33

(Cement Concrete Workers District Council)

DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2018 - 6/30/2019
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: 7/1/2018 - 6/30/2019
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: 7/1/2018 - 6/30/2019
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: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

(Local #197)

DOCKBUILDER/PILE DRIVER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.54

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.54

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.54

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $33.54

(Carpenters District Council)

ELECTRICIAN
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Term: 0-6 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $14.50
Supplemental Benefit Rate per Hour: $12.63
Overtime Supplemental Rate Per Hour: $13.58

Electrician (First Term: 7-12 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $15.50
Supplemental Benefit Rate per Hour: $13.14
Overtime Supplemental Rate Per Hour: $14.16

Electrician (Second Term: 0-6 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $16.50
Supplemental Benefit Rate per Hour: $13.64
Overtime Supplemental Rate Per Hour: $14.73

Electrician (Second Term: 7-12 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $17.50
Supplemental Benefit Rate per Hour: $14.15
Overtime Supplemental Rate Per Hour: $15.31

Electrician (Third Term: 0-6 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $14.66
Overtime Supplemental Rate Per Hour: $15.88

Electrician (Third Term: 7-12 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $19.50
Supplemental Benefit Rate per Hour: $15.17
Overtime Supplemental Rate Per Hour: $16.45

Electrician (Fourth Term: 0-6 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $20.50
Supplemental Benefit Rate per Hour: $15.68
Overtime Supplemental Rate Per Hour: $17.03

Electrician (Fourth Term: 7-12 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $22.50
Supplemental Benefit Rate per Hour: $16.70
Overtime Supplemental Rate Per Hour: $18.18

Electrician (Fifth Term: 0-12 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $24.50
Supplemental Benefit Rate per Hour: $20.30
Overtime Supplemental Rate Per Hour: $21.84

Electrician (Fifth Term: 13-18 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $29.00
Supplemental Benefit Rate per Hour: $22.65
Overtime Supplemental Rate Per Hour: $24.47

Overtime Description

Overtime Wage paid at time and one half the regular rate

(Local #3)

ELEVATOR CONSTRUCTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $30.89

Elevator (Constructor) - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $31.38

Elevator (Constructor) - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $32.36

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $33.34

(Local #1)

ELEVATOR REPAIR & MAINTENANCE
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $30.82

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $31.30

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $32.26

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $33.23

(Local #1)

ENGINEER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.38
Supplemental Benefit Rate per Hour: $25.53

Engineer - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $31.72
Supplemental Benefit Rate per Hour: $25.53

Engineer - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $34.89
Supplemental Benefit Rate per Hour: $25.53

Engineer - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $38.06
Supplemental Benefit Rate per Hour: $25.53

(Local #15)

ENGINEER - OPERATING
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour 40% of Journeyperson's Rate
Supplemental Benefit Per Hour: $21.60

Operating Engineer - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's Rate
Supplemental Benefit Per Hour: $21.60

Operating Engineer - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's Rate
Supplemental Benefit Per Hour: $21.60

(Local #14)

FLOOR COVERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $31.14

Floor Coverer (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $31.14

Floor Coverer (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $31.14

Floor Coverer (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $31.14

(Carpenters District Council)

GLAZIER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $15.66

Glazier (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $25.76

Glazier (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $29.02

Glazier (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $35.07

(Local #1281)

HAZARDOUS MATERIAL HANDLER
(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Handler (First 1000 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 78% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $14.25

Handler (Second 1000 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $14.25

Handler (Third 1000 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 83% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $14.25

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 89% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $14.25

(Local #78)

HEAT & FROST INSULATOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.17
Supplemental Benefit Rate per Hour: $18.79

House Wrecker - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $22.32
Supplemental Benefit Rate per Hour: $18.79

House Wrecker - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $23.97
Supplemental Benefit Rate per Hour: $18.79

House Wrecker - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.53
Supplemental Benefit Rate per Hour: $18.79

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - 1st Ten Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $40.20

Iron Worker (Ornamental) - 11 -16 Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $41.44

Iron Worker (Ornamental) - 17 - 22 Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $42.68

Iron Worker (Ornamental) - 23 - 28 Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $45.17

Iron Worker (Ornamental) - 29 - 36 Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $47.65

(Local #580)

IRON WORKER - STRUCTURAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.27
Supplemental Benefit Rate per Hour: $51.18

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.87
Supplemental Benefit Rate per Hour: $51.18

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $27.47
Supplemental Benefit Rate per Hour: $51.18

(Local #40 and #361)

LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE LAYER & COMMON)

(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First 1000 hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $42.63

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Second 1000 hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $42.63

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Third 1000 hours

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $42.63

Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - Fourth 1000 hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: $42.63

(Local #731)

MARBLE MECHANICS
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Polishers & Finishers - Third 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Polishers & Finishers - Fourth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

MASON TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.39
Supplemental Benefit Rate per Hour: $19.90

Mason Tender - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $22.54
Supplemental Benefit Rate per Hour: $19.90

Mason Tender - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $24.29
Supplemental Benefit Rate per Hour: $19.95

Mason Tender - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.95
Supplemental Benefit Rate per Hour: $19.95

(Local #79)

METALLIC LATHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.38
Supplemental Benefit Rate per Hour: $14.96

Metallic Lather (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $30.38
Supplemental Benefit Rate per Hour: $16.96

Metallic Lather (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $35.38
Supplemental Benefit Rate per Hour: $18.92

Metallic Lather (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $37.38
Supplemental Benefit Rate per Hour: $19.92

(Local #46)

MILLWRIGHT
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.33
Supplemental Benefit Rate per Hour: $34.28

Millwright (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $33.48
Supplemental Benefit Rate per Hour: $37.88

Millwright (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $38.63
Supplemental Benefit Rate per Hour: $42.13

Millwright (Fourth Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.93
Supplemental Benefit Rate per Hour: $48.69

(Local #740)

PAINTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $17.00
Supplemental Benefit Rate per Hour: $14.46

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.25
Supplemental Benefit Rate per Hour: $18.63

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.50
Supplemental Benefit Rate per Hour: $21.86

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $34.00
Supplemental Benefit Rate per Hour: $27.88

(District Council of Painters)

PAINTER - METAL POLISHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $13.00
Supplemental Benefit Rate per Hour: $5.13

Metal Polisher (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $13.00
Supplemental Benefit Rate per Hour: $5.13

Metal Polisher (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $15.75
Supplemental Benefit Rate per Hour: $5.13

(Local 8A-28)

PAINTER - STRUCTURAL STEEL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #806)

PAVER AND ROADBUILDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.36
Supplemental Benefit Rate per Hour: $20.30

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $30.00
Supplemental Benefit Rate per Hour: $20.30

(Local #1010)

PLASTERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer - First Year: 1st Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $13.43

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $13.88

Plasterer - First Year: 2nd Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $13.91

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $14.36

Plasterer - Second Year: 1st Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $15.88

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $16.44

Plasterer - Second Year: 2nd Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $16.96

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $17.53

Plasterer - Third Year: 1st Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $19.13

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $19.72

Plasterer - Third Year: 2nd Six Months

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $20.21

Effective Period: 8/1/2018 - 6/30/2019
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $20.81

(Local #530)

PLASTERER - TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer Tender - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.39
Supplemental Benefit Rate per Hour: $19.90

Plasterer Tender - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $22.54
Supplemental Benefit Rate per Hour: $19.90

Plasterer Tender - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $24.29
Supplemental Benefit Rate per Hour: $19.95

Plasterer Tender - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.95
Supplemental Benefit Rate per Hour: $19.95

(Local #79)

PLUMBER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $16.28
Supplemental Benefit Rate per Hour: $5.43

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $19.28
Supplemental Benefit Rate per Hour: $6.43

Plumber - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.93
Supplemental Benefit Rate per Hour: $18.10

Plumber - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $29.03
Supplemental Benefit Rate per Hour: $18.10

Plumber - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $31.88
Supplemental Benefit Rate per Hour: $18.10

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $33.28
Supplemental Benefit Rate per Hour: $18.10

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.35
Supplemental Benefit Rate per Hour: $18.10

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.89
Supplemental Benefit Rate per Hour: $13.64

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.97
Supplemental Benefit Rate per Hour: $18.15

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $34.12
Supplemental Benefit Rate per Hour: $20.90

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.33
Supplemental Benefit Rate per Hour: $21.60

(Bricklayer District Council)

ROOFER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 35% of Journeyperson's Rate
Supplemental Rate Per Hour: 20% of Journeyperson's Rate

Roofer - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's Rate

Roofer - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's Rate

Roofer - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's Rate

(Local #8)

SHEET METAL WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 25% of Journeyperson's rate
Supplemental Rate Per Hour: $6.45

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $18.07

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $24.76

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $29.17

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $29.17

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $35.85

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $35.85

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $40.30

(Local #28)

SIGN ERECTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $15.28

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $17.33

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $19.38

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $21.45

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $28.98

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $31.53

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $34.80

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $37.43

Sign Erector - Fifth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $40.03

Sign Erector - Sixth Year

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $42.63

(Local #137)

STEAMFITTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate and Supplemental Rate per Hour: 65% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate and Supplemental Rate Per Hour: 85% of Journeyperson's rate.

(Local #638)

STONE MASON - SETTER
(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
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: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 100% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

TAPER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Drywall Taper - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Drywall Taper - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1974)

TILE LAYER - SETTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2018 - 6/30/2019
Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

(Local #7)

TIMBERPERSON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $33.19

Timberperson - Second Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $33.19

Timberperson - Third Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $33.19

Timberperson - Fourth Year

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $33.19

(Local #1536)

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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. 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.

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.

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/contract/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.

Wasyl Kinach, P.E.
Director of Classifications
Bureau of Labor Law

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ASBESTOS HANDLER
SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $55.21
Supplemental Benefit Rate per Hour: $42.53

Blaster- Hydraulic Trac Drill

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $49.35
Supplemental Benefit Rate per Hour: $42.53

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.52
Supplemental Benefit Rate per Hour: $42.53

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.00
Supplemental Benefit Rate per Hour: $42.53

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $42.53

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
Labor Day
Thanksgiving Day

Shift Rates
When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

BOILERMAKER

Boilermaker

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $57.17
Supplemental Benefit Rate per Hour: $43.62
Supplemental Note: For time and one half overtime - $64.81 For double overtime - $86.00

Overtime Description
For Repair and Maintenance work:
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
For New Construction work:
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day

Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Quadruple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
Good Friday
Day after Thanksgiving
Day before Christmas
Day before New Year's Day

Shift Rates
When shifts are required, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work seven and one-half (7 ½) hours and receive eight hours at the regular straight time hourly rate plus twenty-five cents ($0.25) per hour. The third shift shall work seven (7) hours and receive eight hours at the regular straight time hourly rate plus fifty cents ($0.50) per hour. A thirty (30) minute lunch period shall not be considered as time worked. Work in excess of the above shall be paid overtime at the appropriate new construction work or repair work overtime wage and supplemental benefit hourly rate.

(Local #5)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $55.10
Supplemental Benefit Rate per Hour: $31.20

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

Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Overtime rates to be paid outside the regular scheduled work day.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.50
Supplemental Benefit Rate per Hour: $46.28

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.

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)

CARPENTER - HEAVY CONSTRUCTION WORK
(Construction of Engineering Structures and Building Foundations)

Heavy Construction Work

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $53.63
Supplemental Benefit Rate per Hour: $50.67

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

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)

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

Carpenter High Rise A

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.78
Supplemental Benefit Rate per Hour: $43.34

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $40.19
Supplemental Benefit Rate per Hour: $16.65

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.50
Supplemental Benefit Rate per Hour: $39.46

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)

CEMENT & CONCRETE WORKER

Cement & Concrete Worker

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.48
Supplemental Benefit Rate per Hour: $26.00
Supplemental Note: $29.50 on Saturdays; $33.00 on Sundays & Holidays

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $32.00
Supplemental Benefit Rate per Hour: $18.00
Supplemental Note: $19.50 on Saturdays; $21.00 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)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.97
Supplemental Benefit Rate per Hour: $39.71
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

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)

CORE DRILLER

Core Driller

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $39.69
Supplemental Benefit Rate per Hour: $25.45

Core Driller Helper

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $31.62
Supplemental Benefit Rate per Hour: $25.45

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.46
Supplemental Benefit Rate per Hour: $25.45

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.30
Supplemental Benefit Rate per Hour: $25.45

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $22.13
Supplemental Benefit Rate per Hour: $25.45

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)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.86
Supplemental Benefit Rate per Hour: $51.40
Supplemental Note: The above supplemental rate applies for work performed in Manhattan, Bronx, Brooklyn and Queens. $52.82 - For work performed in Staten Island.

Derrick Person & Rigger - Site Work

Assists the Stone Mason-Setter in the setting of stone

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $40.29
Supplemental Benefit Rate per Hour: $39.23

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)

DIVER

Diver (Marine)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $67.94
Supplemental Benefit Rate per Hour: $50.67

Diver Tender (Marine)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.24
Supplemental Benefit Rate per Hour: $50.67

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $53.63
Supplemental Benefit Rate per Hour: $50.67

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Dump Truck

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.18
Supplemental Benefit Rate per Hour: $47.22
Supplemental Note: Over 40 hours worked: at time and one half rate - $20.58; at double time rate - $27.44

Driver - Tractor Trailer

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $42.97
Supplemental Benefit Rate per Hour: $47.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $18.30; at double time rate - $24.41

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.53
Supplemental Benefit Rate per Hour: $47.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $18.30 at double time rate - $24.41

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.

Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $38.40
Supplemental Benefit Rate per Hour: $44.12
Supplemental Note: Over 40 hours worked: time and one half rate $15.99, double time rate $21.33

Overtime Description
For Paid Holidays: Employees working two (2) days in the calendar week in which the holiday falls are to paid for these holidays, provided they shape each remaining workday during that calendar week.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Christmas Day

(Local #282)

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $56.00
Supplemental Benefit Rate per Hour: $55.72

Electrician "A" (Regular Day Overtime after 7 hrs / Day Shift Overtime after 8 hrs)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $84.00
Supplemental Benefit Rate per Hour: $59.23

Electrician "A" (Swing Shift)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $65.71
Supplemental Benefit Rate per Hour: $63.52

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $98.57
Supplemental Benefit Rate per Hour: $67.64

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $73.60
Supplemental Benefit Rate per Hour: $70.09

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $110.40
Supplemental Benefit Rate per Hour: $74.70

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on a holiday.
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day

Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
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 $25.92.

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $29.00
Supplemental Benefit Rate per Hour: $22.65
First and Second Year "M" Wage Rate Per Hour: $24.50
First and Second Year "M" Supplemental Rate: $20.30

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.50
Supplemental Benefit Rate per Hour: $24.47
First and Second Year "M" Wage Rate Per Hour: $36.75
First and Second Year "M" Supplemental Rate: $21.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #3)

ELECTRICIAN - ALARM TECHNICIAN
(Scope of Work - Inspect, test, repair, and replace defective, malfunctioning, or broken devices, components and controls of Fire, Burglar and Security Systems)

Alarm Technician

Effective Period: 7/1/2018 - 3/9/2019
Wage Rate per Hour: $32.90
Supplemental Benefit Rate per Hour: $16.82
Supplemental Note: $15.32 only after 8 hours worked in a day

Effective Period: 3/10/2019 - 6/30/2019
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

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
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)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $56.00
Supplemental Benefit Rate per Hour: $57.63

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.16
Supplemental Benefit Rate per Hour: $42.19

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $36.11
Supplemental Benefit Rate per Hour: $37.93

Overtime Description

Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.
Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.
Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $64.48
Supplemental Benefit Rate per Hour: $35.80

Overtime Description

For New Construction: work performed after 7 or 8 hour day, Saturday, Sunday or between 4:30pm and 7:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 7:00 am shall be paid time and one half.

Overtime
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.49
Supplemental Benefit Rate per Hour: $35.65

Overtime Description
For Scheduled Service Work: Double time - work scheduled in advance by two or more workers performed on Sundays, Holidays, and between midnight and 7:00am.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day

Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Afternoon shift - regularly hourly rate plus a (15%) fifteen percent differential. Graveyard shift - time and one half the regular rate.

Vacation

Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ENGINEER

Engineer - Heavy Construction Operating Engineer I

Cherrypickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $68.99
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $110.38

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherrypickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar nature, shot blaster, skid steer machines and machines of a similar nature including bobcat, pile rig rubber-tired excavator (37,000 lbs. and under), 2 man auger.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $66.92
Supplemental Benefit Rate per Hour: $38.28

Supplemental Note: $69.16 on overtime
Shift Wage Rate: $107.07

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $63.44
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $101.50

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $66.60
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $106.56

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $87.74
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $140.38

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.66

Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $69.86

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $44.82
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $71.71

Engineer - Heavy Construction Oilers I

Gradalls, Cold Planer Grader, Concrete Pumps, Driving Truck Cranes, Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $59.97
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $95.95

Engineer - Heavy Construction Oilers II

All gasoline, electric, diesel or air operated Shovels, Draglines, Backhoes, Keystones, Pavers, Gunite Machines, Battery of Compressors, Crawler Cranes, two-person Trenching Machines.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.22
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $65.95

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $63.75
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $102.00

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $59.61
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $95.38

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.16
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime
Shift Wage Rate: $72.26

Overtime Description
On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

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Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $61.05
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $47.25
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime

Engineer - Building Work Oilers I

All gasoline, electric, diesel or air operated Gradealls: Concrete Pumps, Overhead Cranes in Power Houses: Their duties shall be to assist the Engineer in oiling, greasing and repairing of all machines; Driving Truck Cranes: Driving and Operating Fuel and Grease Trucks, Cherrypickers (hydraulic cranes) over 70,000 GVW, and machines of a similar nature.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $58.01
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 on overtime

Engineer - Building Work Oilers II

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.89
Supplemental Benefit Rate per Hour: $38.28
Supplemental Note: $69.16 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)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $39.90
Supplemental Benefit Rate per Hour: $21.60
Supplemental Note: Overtime Benefit Rate - $29.83 per hour (time & one half) $38.05 per hour (double time).

Instrument Person

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $32.81
Supplemental Benefit Rate per Hour: $21.60
Supplemental Note: Overtime Benefit Rate - $29.83 per hour (time & one half) $38.05 per hour (double time).

Rodperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.34
Supplemental Benefit Rate per Hour: $21.60
Supplemental Note: Overtime Benefit Rate - $29.83 per hour (time & one half) $38.05 per hour (double time).

Overtime Description
Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays
New Year's Day
Lincoln's Birthday
President's Day

Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (BUILDING CONSTRUCTION)
(Construction of Building Projects, Concrete Superstructures, etc.)

Field Engineer - BC Party Chief

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $63.81
Supplemental Benefit Rate per Hour: $33.93
Supplemental Note: Overtime Benefit Rate - $47.57 per hour (time & one half) $61.21 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $49.60
Supplemental Benefit Rate per Hour: $33.93
Supplemental Note: Overtime Benefit Rate - $47.57 per hour (time & one half) $61.21 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $32.11
Supplemental Benefit Rate per Hour: $33.93
Supplemental Note: Overtime Benefit Rate - $47.57 per hour (time & one half) $61.21 per hour (double time).

Overtime Description
Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays
New Year's Day
President's Day
Good Friday

Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (HEAVY CONSTRUCTION)

(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $72.19
Supplemental Benefit Rate per Hour: $35.32
Supplemental Note: Overtime benefit rate - $49.53 per hour (time & one half), $63.74 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $53.03
Supplemental Benefit Rate per Hour: $35.32
Supplemental Note: Overtime benefit rate - $49.53 per hour (time & one half), $63.74 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $44.51
Supplemental Benefit Rate per Hour: $35.32
Supplemental Note: Overtime benefit rate - $49.53 per hour (time & one half), $63.74 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Lincoln's Birthday

President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $67.31
Supplemental Benefit Rate per Hour: $34.82
Supplemental Note: Overtime benefit rate - $48.78 per hour (time & one half), $62.74 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.47
Supplemental Benefit Rate per Hour: $34.82
Supplemental Note: Overtime benefit rate - $48.78per hour (time & one half), $62.74 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $35.14
Supplemental Benefit Rate per Hour: $34.82
Supplemental Note: Overtime benefit rate - $48.78 per hour (time & one half), $62.74 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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $79.03
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $126.45

Operating Engineer - Road & Heavy Construction II

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $81.79
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $130.86

Operating Engineer - Road & Heavy Construction III

Mine Hoists, Cranes, etc. (Used as Mine Hoists)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $84.39
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $135.02

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $82.38
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $131.81

Operating Engineer - Road & Heavy Construction V

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $80.77
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75overtime hours
Shift Wage Rate: $129.23

Operating Engineer - Road & Heavy Construction VI

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $76.78
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $122.85

Operating Engineer - Road & Heavy Construction VII

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $62.16
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $99.46

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.42
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $60.82

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $73.05
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $116.88

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $67.21
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $107.54

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.38
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $83.81

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $77.58
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $124.13

Operating Engineer - Road & Heavy Construction XIII

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $75.16
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Shift Wage Rate: $120.26

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $71.89
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $115.02

Operating Engineer - Road & Heavy Construction XV

Compressors (Portable Single or two in Battery, not over 100 feet apart), Pumps (River Cofferdam) and Welding Machines, Push Button Machines, All Engines Irrespective of Power (Power-Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.73
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $77.97

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $68.69
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $109.90

Operating Engineer - Road & Heavy Construction XVII

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $69.21
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $110.74

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $98.99
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $158.38

Operating Engineer - Paving I

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $76.78
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $122.85

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $74.81
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $119.70

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $63.40
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $101.44

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $82.02
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $49.10
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Concrete III

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $65.70
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $84.83
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $135.73

Operating Engineer - Steel Erection II

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $81.54
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $130.46

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.69
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $77.90

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.39

Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
Shift Wage Rate: $74.22

Operating Engineer - Building Work I

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $67.78
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.96
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $77.03
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $81.56
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $75.21
Supplemental Benefit Rate per Hour: $31.85

Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $74.43
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $59.35
Supplemental Benefit Rate per Hour: $31.85
Supplemental Note: $57.75 overtime hours
For New House Car projects Wage Rate per Hour $47.54

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)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.50
Supplemental Benefit Rate per Hour: $45.88

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Two shifts may be utilized with the first shift working 8:00 A.M. to the end of the shift at the straight time of pay. The second shift will receive one hour at double time rate for the last hour of the shift. (eight for seven, nine for eight).

(Carpenters District Council)

GLAZIER
(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.55
Supplemental Benefit Rate per Hour: $41.39
Supplemental Note: Supplemental Benefit Overtime Rate: $62.10

Overtime Description
An optional 8th hour can be worked at straight time rate. If 9th hour is worked, then both hours or more (8th & 9th or more) will be at the double time rate of pay.

Overtime
Double time the regular rate after a 7 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Shifts shall be any 7 hours beyond 4:00 P.M. for which the glazier shall receive 8 hours pay for 7 hours worked.

(Local #1281)

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. Except where enumerated (i.e. plate glass windows) does not apply to non-residential buildings.)

Craft Jurisdiction for repair, maintenance and fabrication

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

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.06
Supplemental Benefit Rate per Hour: $21.54

Overtime
Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 hours in any work week.

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

(Local #1281)

HAZARDOUS MATERIAL HANDLER
(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

Handler

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $36.00
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

(Local #78 and Local #12A)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $61.21
Supplemental Benefit Rate per Hour: $39.46

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.
Off hour work in occupied or retail buildings may be worked on weekdays with an increment of $1.00 per hour and eight hours pay for seven (7) hours worked. Double time will apply for over seven (7) hours worked on weekdays, weekends or holidays.

(Local #12) (BCA)

HOUSE WRECKER
(TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $36.88
Supplemental Benefit Rate per Hour: $29.47

House Wrecker - Tier B

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.11
Supplemental Benefit Rate per Hour: $21.88

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day

Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

Iron Worker - Ornamental

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $44.40
Supplemental Benefit Rate per Hour: $52.62
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)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.35
Supplemental Benefit Rate per Hour: $73.95
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time.

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)

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$42.00**
Supplemental Benefit Rate per Hour: **$42.63**

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
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
Labor Day
Thanksgiving Day

Shift Rates
When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LANDSCAPING

(Landscaping tasks, as well as tree pruning, tree removing, spraying and maintenance in connection with the planting of street trees and the planting of trees in city parks but not when such activities are performed as part of, or in connection with, other construction or reconstruction projects.)

Landscaper (Above 6 years experience)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $30.25
Supplemental Benefit Rate per Hour: $16.05

Landscaper (3 - 6 years experience)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $29.25
Supplemental Benefit Rate per Hour: $16.05

Landscaper (up to 3 years experience)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.75
Supplemental Benefit Rate per Hour: $16.05

Groundperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $26.75
Supplemental Benefit Rate per Hour: $16.05

Tree Remover / Pruner

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $35.25
Supplemental Benefit Rate per Hour: $16.05

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $25.25
Supplemental Benefit Rate per Hour: $16.05

Watering - Plant Maintainer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $20.22

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
Work performed on a 4pm to 12am shift has a 15% differential. Work performed on a 12am to 8am shift has a 20% differential.

(Local #175)

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$53.63**
Supplemental Benefit Rate per Hour: **$40.35**

Marble Finisher

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$42.21**
Supplemental Benefit Rate per Hour: **$37.71**

Marble Polisher

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$37.99**
Supplemental Benefit Rate per Hour: **$29.48**

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
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

MASON TENDER

Mason Tender

Effective Period: 7/1/2018 - 6/30/2019
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.

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)

Mason Tender Tier A

Tier A Interior Demolition Worker performs all burning, chopping, and other technically skilled tasks related to interior demolition work.

Effective Period: 7/1/2018 - 6/30/2019
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: 7/1/2018 - 6/30/2019
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)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.28
Supplemental Benefit Rate per Hour: $44.92
Supplemental Note: Supplemental benefits for overtime are paid at the appropriate overtime rate.

Overtime Description
Overtime would be time and one half the regular rate after a seven (7) or eight (8) hours workday, which would be set at the start of the job.

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
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)

MILLWRIGHT

Millwright

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.70
Supplemental Benefit Rate per Hour: $53.21

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)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $48.85
Supplemental Benefit Rate per Hour: $41.33
Supplemental Note: Supplemental benefits for overtime to be paid at the rate of $52.35 per hour.

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $47.25
Supplemental Benefit Rate per Hour: $41.31
Supplemental Note: Supplemental benefits for overtime to be paid at the rate of $52.33 per hour.

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $47.25
Supplemental Benefit Rate per Hour: $41.33
Supplemental Note: Supplemental benefits for overtime to be paid at the rate of $52.33 per hour.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.50
Supplemental Benefit Rate per Hour: $30.87
Supplemental Note: $ 35.50 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.50
Supplemental Benefit Rate per Hour: $30.87
Supplemental Note: $ 35.50 on overtime

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(District Council of Painters #9)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $30.58
Supplemental Benefit Rate per Hour: $7.16

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $31.53
Supplemental Benefit Rate per Hour: $7.16

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2018 - 6/30/2019
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

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.16
Supplemental Benefit Rate per Hour: $16.04

Assistant Sign Painter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $34.97
Supplemental Benefit Rate per Hour: $14.92

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)

PAINTER - STRIPER

Striper (paint)

Effective Period: 7/1/2018 - 6/30/2019

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: 7/1/2018 - 6/30/2019
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
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Employees hired before April 1, 2003: 15% night shift premium differential for work commenced at 9:00 PM or later.

Vacation
Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation. Vacation must be taken during winter months. 2 Personal Days except employees hired after 4/1/12 who do not have 2 years of service.

(Local #917)

PAINTER - STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $49.50
Supplemental Benefit Rate per Hour: $38.83

Painter - Power Tool

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $55.50
Supplemental Benefit Rate per Hour: $38.83
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.

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)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $44.89
Supplemental Benefit Rate per Hour: $33.13

Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Evening shift - 4:30 P.M. to 12:00 Midnight (regular rate of pay); any work performed before 7:00 A.M. shall be at time and one half the regular base rate of pay.

(District Council of Painters #9)

PAVER AND ROADBUILDER

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.35
Supplemental Benefit Rate per Hour: $43.01
Supplemental Note: For time and one half overtime - $46.89 For double overtime - $50.76

Paver & Roadbuilder - Laborer

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work before the installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry seal coating, maintenance of safety surfaces; play equipment installation, and other related work.

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $42.48
Supplemental Benefit Rate per Hour: $43.01
Supplemental Note: For time and one half overtime - $46.89 For double overtime - $50.76

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.95
Supplemental Benefit Rate per Hour: $43.01
Supplemental Note: For time and one half overtime - $46.89 For double overtime - $50.76

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $46.35
Supplemental Benefit Rate per Hour: $43.01
Supplemental Note: For time and one half overtime - $46.89 For double overtime - $50.76

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $42.48
Supplemental Benefit Rate per Hour: $43.01
Supplemental Note: For time and one half overtime - $46.89 For double overtime - $50.76

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.

(Local #1010)

PLASTERER

Plasterer

Effective Period: 7/1/2018 - 7/31/2018
Wage Rate per Hour: $45.58
Supplemental Benefit Rate per Hour: $25.87

Effective Period: 8/1/2018 - 6/30/2019
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)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2018 - 6/30/2019
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)

PLUMBER

Plumber

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $68.40
Supplemental Benefit Rate per Hour: $33.80
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Plumber - Temporary Services

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $54.80
Supplemental Benefit Rate per Hour: $26.96

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)

PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

Plumber

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.55
Supplemental Benefit Rate per Hour: $16.61

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $47.47
Supplemental Benefit Rate per Hour: $24.36

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday.
50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER: PUMP & TANK
Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $65.65
Supplemental Benefit Rate per Hour: $25.06

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER
(Exterior Building Renovation)

Journeyperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.57
Supplemental Benefit Rate per Hour: $25.80

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)

ROOFER

Roofer

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$42.50**
Supplemental Benefit Rate per Hour: **$33.37**

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
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)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $49.65
Supplemental Benefit Rate per Hour: $49.15
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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $39.72
Supplemental Benefit Rate per Hour: $49.15

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $12.90
Supplemental Benefit Rate per Hour: $8.07

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates

Work that can only be performed outside regular working hours (eight hours of work between 7:30 A.M. and 3:30 P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate. Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays.

(Local #28

SHEET METAL WORKER - SPECIALTY
(Decking & Siding)

Sheet Metal Specialty Worker

The first worker to perform this work must be paid at the rate of the Sheet Metal Worker. The second and third workers shall be paid the Specialty Worker Rate. The ratio of One Sheet Metal Worker, then Two Specialty Workers shall be utilized thereafter.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.26
Supplemental Benefit Rate per Hour: $25.66
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #28)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.19
Supplemental Benefit Rate per Hour: $3.03

Shipyard Mechanic - Second Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $20.87
Supplemental Benefit Rate per Hour: $2.75

Shipyard Laborer - First Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.89
Supplemental Benefit Rate per Hour: $2.79

Shipyard Laborer - Second Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $15.71
Supplemental Benefit Rate per Hour: $2.55

Shipyard Dockhand - First Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $21.57
Supplemental Benefit Rate per Hour: $2.78

Shipyard Dockhand - Second Class

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $16.96
Supplemental Benefit Rate per Hour: $2.60

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

SIGN ERECTOR
(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: **$48.50**
Supplemental Benefit Rate per Hour: **$52.89**

Overtime

Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter I

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $57.25
Supplemental Benefit Rate per Hour: $55.79
Supplemental Note: Overtime supplemental benefit rate: $110.84

Steamfitter -Temporary Services

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.51
Supplemental Benefit Rate per Hour: $45.22

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.

Steamfitter II

For heating, ventilation, air conditioning and mechanical public work contracts with a dollar value not to exceed $15,000,000 and for fire protection/sprinkler public work contracts not to exceed $1,500,000.

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $57.25
Supplemental Benefit Rate per Hour: $55.79
Supplemental Note: Overtime supplemental benefit rate: $110.84

Steamfitter -Temporary Services

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.51
Supplemental Benefit Rate per Hour: $45.22

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
May be performed outside of the regular workday except Saturday, Sunday and Holidays. A shift shall consist of eight working hours. All work performed in excess of eight hours shall be paid at double time. No shift shall commence after 7:00 P.M. on Friday or 7:00 P.M. the day before holidays. All work performed after 12:01 A.M.

Saturday or 12:01 A.M. the day before a Holiday will be paid at double time. When shift work is performed the wage rate for regular time worked is a thirty percent premium together with fringe benefits.

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

Local #638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER
(Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.50
Supplemental Benefit Rate per Hour: $16.56

Refrigeration and Air Conditioner Service Person V

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $34.10
Supplemental Benefit Rate per Hour: $14.80

Refrigeration and Air Conditioner Service Person IV

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $28.25
Supplemental Benefit Rate per Hour: $13.36

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $24.24
Supplemental Benefit Rate per Hour: $12.29

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: 7/1/2018 - 6/30/2019

Wage Rate per Hour: $20.10
Supplemental Benefit Rate per Hour: $11.29

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: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $14.71
Supplemental Benefit Rate per Hour: $10.12

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #638B)

STONE MASON - SETTER

Stone Mason - Setter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $53.62
Supplemental Benefit Rate per Hour: $41.65

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
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates
For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $47.82
Supplemental Benefit Rate per Hour: $25.61

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

(Local #1974)

TELECOMMUNICATION WORKER
(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects. Locate & mark underground telecommunications cables and utilities for street excavation.)

Telecommunication Worker

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $43.66
Supplemental Benefit Rate per Hour: $23.15
Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. $22.84 for Staten Island only.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day

Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $41.77
Supplemental Benefit Rate per Hour: $30.87

Overtime

Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TILE LAYER - SETTER

Tile Layer - Setter

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $53.98
Supplemental Benefit Rate per Hour: $35.38

Overtime

Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $49.10
Supplemental Benefit Rate per Hour: $49.97

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)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $62.37
Supplemental Benefit Rate per Hour: $52.39

Tunnel Workers (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $60.21
Supplemental Benefit Rate per Hour: $50.65

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $59.11
Supplemental Benefit Rate per Hour: $49.74

Outside Lock Tender, Outside Gauge Tender,Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $58.04
Supplemental Benefit Rate per Hour: $48.81

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $58.04
Supplemental Benefit Rate per Hour: $48.81

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $50.87
Supplemental Benefit Rate per Hour: $46.11

Blasters (Free Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $59.52

Supplemental Benefit Rate per Hour: $50.03

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $56.97
Supplemental Benefit Rate per Hour: $47.89

All Others (Free Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $52.63
Supplemental Benefit Rate per Hour: $44.29

Microtunneling (Free Air Rates)

Effective Period: 7/1/2018 - 6/30/2019
Wage Rate per Hour: $45.58
Supplemental Benefit Rate per Hour: $38.31

Overtime Description

For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 7 hour day, or for Saturday, or for Sunday. Double time the regular rate for work on a holiday.
For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #147)

WELDER

TO BE PAID AT THE RATE OF THE JOURNEYPERSON IN THE TRADE PERFORMING THE WORK.

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NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013
Revised - January 15, 2015

DDC STANDARD GENERAL CONDITIONS

FOR SINGLE CONTRACT PROJECTS

No Text

NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

Issue Date - June 01, 2013
Revised - January 15, 2015

DIVISION 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
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SECTION 01 10 00
SUMMARY

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Addendum to the General Conditions: These General Conditions include and are supplemented by the Addendum to the General Conditions (the "Addendum"). The Addendum includes the following: (1) schedules referred to in these General Conditions (Schedule A through F), (2) information regarding the applicability of various articles, and (3) amended articles, if any.

1.2 SUMMARY:

A. This section includes the following:
   1. Scope and Intent
   2. Provisions Referenced in the Contract
   3. Performance of Work During Non-Regular Work Hours (Pursuant to a Change Order)
   4. Interruption of Services at Existing Facilities

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SCOPE AND INTENT:

A. Description of Project: Refer to the Addendum for a description of the project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 B

B. LEED: The City of New York will seek U.S. Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) certification for this Project as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS" and the Addendum to the General Conditions.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 C

C. COMMISSIONING: The project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS, and the Addendum to the General Conditions. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

D. PROGRESS SCHEDULE: Refer to Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION for requirements of the project.

E. COMPLETION OF WORK: Work to be done under the Contract is comprised of the furnishing of all labor, materials, equipment and other appurtenances, and obtaining all regulatory agency approvals necessary and required to complete the construction work in accordance with the Contract.

F. OMISSION OF DETAILS: All work called for in the Specifications applicable to the Contract but not shown on the Contract Drawings in their present form, or vice versa, is required, and shall be performed by the Contractor as though it were originally delineated or described. The cost of such work shall be deemed included in the total Contract Price.

G. WORK NOT IN SPECIFICATIONS OR CONTRACT DRAWINGS: Work not particularly specified in the Specifications nor detailed on the Contract Drawings but involved in carrying out their intent or in the complete and proper execution of the work, is required, and shall be performed by the Contractor. The cost of such work shall be deemed included in the total Contract Price.

H. SILENCE OF THE SPECIFICATIONS: The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best practice is to prevail and that only the best material and workmanship is to be used and interpretation of the Specifications shall be made upon that basis.

I. CONFLICT BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS: Should any conflict occur in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated the most expensive way of doing the work unless the Contractor shall have asked for and obtained a decision in writing from the Commissioner before the submission of the bid as to what shall govern.

1.5 CONTRACT DRAWINGS AND SPECIFICATIONS:

A. SCHEDULE C - The Contract Drawings are listed in Schedule C, which is set forth in the Addendum. Such drawings referred to in the Contract, and in the applicable Specifications for the Contract, bear the general title:

City of New York
Department of Design and Construction
Division of Public Buildings

B. DOCUMENTS FURNISHED TO THE CONTRACTOR - After the award of the Contract, the Contractor will be furnished with five (5) complete sets of paper prints of all Contract Drawings mentioned in Paragraph A above, as well as a copy of the Specifications.

C. ADDITIONAL COPIES of Drawings and Specifications, when requested, will be furnished to the Contractor if available.

D. SUPPLEMENTARY DRAWINGS - When, in the opinion of the Commissioner, it becomes necessary to more fully explain the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings known as Supplementary Drawings will be prepared by the Commissioner.

E. COMPENSATION - Where Supplementary Drawings entail extra work, compensation therefore to the Contractor shall be subject to the terms of the Contract. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings.

F. SUPPLEMENTARY DRAWING PRINTS - Three (3) copies of prints of these Supplementary Drawings will be furnished to the Contractor.

G. COPIES TO SUBCONTRACTORS - The Contractor shall furnish each of its subcontractors and material suppliers such copies of Contract Drawings, Supplementary Drawings, or copies of the Specifications as may be required for its work.

1.6 COORDINATION:

A. COORDINATION AND COOPERATION - The Contractor shall consult and study the requirements of the Contract Drawings and Specifications for all required work, including all work to be performed by trade subcontractors, so that the Contractor may become acquainted with the work of the project as a whole in order to achieve the proper coordination and cooperation necessary for the efficient and timely performance of the work.

B. CONTRACTOR TO CHECK DRAWINGS: - The Contractor shall verify all dimensions, quantities and details shown on the Contract Drawings, Schedules, or other data received from the Commissioner, and shall notify the Commissioner of all errors, omissions, conflicts and discrepancies found therein. Notice of such errors shall be given before the Contractor proceeds with any work. Figures shall be used in preference to scale dimensions and large-scale drawings in preference to small-scale drawings.

1.7 SHOP DRAWINGS AND RECORD DRAWINGS:

Refer to Division I Section 01 33 00 – SUBMITAL PROCEDURES and Section 01 78 39 – PROJECT RECORD DRAWINGS for requirements applicable to shop drawings and record drawings.

1.8 TEMPORARY FACILITIES, SERVICES AND CONTROLS:

Refer to Division I Section 01 50 00 – TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

1.9 DUST CONTROL:

The Contractor shall prepare, execute and manage a "Dust Control Plan" for the prevention of the emission of dust from construction related activities in compliance with 15 RCNY 13-01 et. seq.

1.10 PROVISIONS REFERENCED IN THE CONTRACT:

A. SCHEDULE A - Various Articles of the Contract refer to requirements set forth in Schedule A of the General Conditions. Schedule A, which is included in the Addendum, sets forth (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the Contract.

B. EXTENSION OF TIME - Applications for Extensions of Time, as indicated in Article 13 of the Contract, shall be made in accordance with the Rules of the Procurement Policy Board.

C. PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE CONTRACT – In order to better insure the availability of materials, fixtures and equipment when needed for the work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the work, but only in strict accordance with, and subject to, all the terms and conditions set forth in the Specifications, unless an alternate method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment.

1. The Contractor shall submit to the Commissioner a written request, in quadruplicate, for payment for materials purchased or to be purchased for which the Contractor needs to be paid prior to their actual incorporation in the work. The request shall be accompanied by a schedule of the types and quantities of materials, and shall state whether such materials are to be stored on or off the site.

2. Where the materials are to be stored off the site, they shall be stored at a place other than the Contractor's premises (except with the written consent of the Commissioner) and under the conditions prescribed or approved by the Commissioner. The Contractor shall set apart and separately store at the place or places of storage all materials and shall clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, shall not at any time move any of said materials to another off-site place of storage without the prior written consent of the Commissioner. Materials may be removed from their place of storage off the site for incorporation in the work upon approval of the Resident Engineer.

3. Where the materials are to be stored at the site, they shall be stored at such locations as shall be designated by the Resident Engineer and only in such quantities as, in the opinion of the Resident Engineer, will not interfere with the proper performance of the work by the Contractor or by other Contractors then engaged in performing work on the site. Such materials shall not be removed from their place of storage on the site except for incorporation in the work, without the approval of the Resident Engineer.

4. INSURANCE

   a. STORAGE OFF-SITE – Where the materials are stored off the site and until such time as they are incorporated in the work, the Contractor shall fully insure such materials against any and all risks of destruction, damage or loss including but not limited to fire, theft, and any other casualty or happening. The policy of insurance shall be payable to the City of New York. It shall be in such terms and amounts as shall be approved by the Commissioner and shall be placed with a company duly licensed to do business in the State of New York. The Contractor shall deliver the original and one (1) copy of such policy or policies marked "Fully Paid" to the Commissioner.

   b. STORAGE ON THE SITE – Where the materials are stored at the site, the Contractor shall furnish satisfactory evidence to the Commissioner that they are properly insured against loss, by endorsements or otherwise, under the policy or policies of insurance obtained by the Contractor to cover losses to materials owned or installed by the Contractor. The policy of insurance shall cover fire and extended coverage against windstorm, hail, explosion and riot attending a strike, civil commotion, aircraft, vehicles and smoke.

5. All costs, charges and expenses arising out of the storage of such materials, shall be paid by the Contractor and the City hereby reserves the right to retain out of any partial or final payment made under the Contract an amount sufficient to cover such costs, charges and expenses with the understanding that the City shall have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There shall be no

increase in the Contract price for such costs, charges and expenses and the Contractor shall not make any claim or demand for compensation therefore.

6. The Contractor shall pay any and all costs of handling and delivery of materials, to the place of storage and from the place of storage to the site of the work; and the City shall have the right to retain from any partial or final payment an amount sufficient to cover the cost of such handling and delivery.

7. In the event that the whole or any part of these materials are lost, damaged or destroyed in advance of their satisfactory incorporation in the work, the Contractor, at the Contractor's own cost, shall replace such lost, damaged or destroyed materials of the same character and quality. The City will reimburse the Contractor for the cost of the replaced materials to the extent, and only to the extent, of the funds actually received by the City under the policies of insurance hereinbefore referred to. Until such time as the materials are replaced, the City will deduct from the value of the stored materials or from any other money due under the Contract, the amount paid to the Contractor for such lost, damaged or destroyed materials.

8. Should any of the materials paid for the City hereunder be subsequently rejected or incorporated in the work in a manner or by a method not in accordance with the Contract Documents, the Contractor shall remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract Documents. Until such materials are replaced, the City will deduct from the value of the stored materials or from any other money due the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.

9. Payments for the cost of materials made hereunder shall not be deemed to be an acceptance of such materials as being in accordance with the Contract Documents, and the Contractor always retains and must comply with the Contractor's duty to deliver to the site and properly incorporate in the work only materials which comply with the Contract Documents.

10. The Contractor shall retain any and all risks in connection with the damage, destruction or loss of the materials paid for hereunder to the time of delivery of the same to the site of the work and their proper incorporation in the work in accordance with the Contract Documents.

11. The Contractor shall comply with all laws and the regulations of any governmental body or agency pertaining to the priority purchase, allocation and use of the materials.

12. When requesting payment for such materials, the Contractor shall submit with the partial estimate duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The executed bills of sale shall transfer title to the materials from the Contractor to the City. (In the event that the invoices state that the material has been purchased by a subcontractor, bills of sale in quadruplicate will also be required transferring title to the materials from subcontractor to the Contractor).

13. Where the Contractor, with the approval of the Commissioner, has purchased unusually large quantities of materials in order to assure their availability for the work, the Commissioner, at the Commissioner's option, may waive the requirements of Paragraph 12 provided the Contractor furnishes evidence in the form of an affidavit from the Contractor in quadruplicate, and such other proof as the Commissioner may require, that the Contractor is the sole owner of such materials and has purchased them free and clear of all liens and other encumbrances. In such event, the Contractor shall pay for such materials and submit proof thereof, in the same manner as provided in Paragraph 12 hereof, within seven (7) days after receipt of payment therefore from the Comptroller. Failure on the part of the Contractor to submit satisfactory evidence that all such materials have been paid for in full, shall preclude the Contractor from payments under the Contract.

14. The Contractor shall include in each succeeding partial estimate requisition a summary of materials stored which shall set forth the quantity and value of materials in storage, on or off the site, at the end of each preceding estimate period; the amount removed for incorporation in the work; the quantity and value of materials delivered during the current period and the total value of materials on hand for which payment thereof will be included in the current payment estimate.

15. Upon proof to the satisfaction of the Commissioner of the actual cost of such materials and upon submission of proper proof of title as required under Paragraph 12 or Paragraph 13 hereof, payment will be made therefore to the extent of 85%, provided however, that the cost so verified, established and approved shall not exceed the estimated cost of such materials included in the approved detailed breakdown estimate submitted in accordance with Article 41 of the Contract; if it does, the City will pay only 85% approved estimated cost.

16. Upon the incorporation in the work of any such materials, which have been paid for in advance of such incorporation in accordance with the foregoing provisions, payment will be made for such materials incorporated in the work pursuant to Article 42 of the Contract, less any sums paid pursuant to Paragraph 15 herein.

D. MOBILIZATION PAYMENT – A line item for mobilization shall be allowed on the Contractor's Detailed Bid Breakdown submitted in accordance with Article 41 of the Contract. The Mobilization Payment is intended to include the cost of required bonds, insurance coverage and/or any other expenses required for the initiation of the Contract Work. All costs for mobilization shall be deemed included in the total Contract Price. The Detailed Bid Breakdown shall reflect, and the Mobilization Payment shall be made, in accordance with the following schedule:

Contract Amount		**Percent**		**Mobilization**
Less than - $ 50,000	x	0	=	0
$ 50,000 - $ 100,000	x		=	$ 6,000
$ 100,001 - $ 500,000	x	6	=	$ 6,000 (min) - $ 30,000 (max)
$ 500,000 - $ 2,500,000	x	5	=	$ 30,000 (min) - $ 125,000 (max)
Over - $ 2,500,000	x	4	=	$ 125,000 (min) - $ 300,000 (max)

The Contractor may requisition for one-half (1/2) of the Mobilization Payment upon satisfactory completion of the following:

1. Installation of any required field office(s).
2. Submission of all required insurance certificates and bonds.
3. Approval by the Department of Design and Construction of the coordinated progress schedule for the project and the Contractor's Shop Drawing schedule.

The remaining balance of the Mobilization Payment may be requisitioned only after 10 percent (10%) of the Contract price, exclusive of the total amount of Mobilization Payments made or to be made hereunder, shall have been approved for payment.

E. ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING: The Contractor shall submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel in Non-Road Vehicles, and the implementation of Best Available Technology (BAT), as set forth in Article 5.4 of the Contract. Such reports shall be submitted in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.11 PERFORMANCE OF WORK DURING NON-REGULAR WORK HOURS:

A. NON-REGULAR WORK HOURS: The Commissioner may issue a change order in accordance with Article 25 of the Contract which (1) directs the Contractor to perform the Work, or specific components thereof, during other than regular work hours (i.e., evenings, weekends and holidays), and (2) provides compensation to the Contractor for costs in connection with the performance of Work during other than regular work hours. The Commissioner may issue a change order if a delay has occurred and such delay is not the fault of the Contractor, or if the work is of such an important nature that delay in completing such work would result in serious disadvantage to the public.

B. PROCEDURE: The Contractor shall (1) obtain whatever permits may be required for performance of the work during other than regular business hours, and (2) pay all necessary fees in connection with such permits. In addition, if directed by the Commissioner, the Contractor shall make immediate application to the Commissioner of the Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.

1.12 INTERRUPTION OF SERVICES AT EXISTING FACILITIES:

A. EVENING AND WEEKEND WORK - Where performance of the Work requires the temporary shutdown(s) of services, such shutdown(s) shall be made at night or on weekends or at such times that will cause no interference with the established routines and operations of the facility in question.

1 Where weekend or evening work is required due to unavoidable service shutdowns, such work shall be performed at no extra cost to the City. Components of the Work that must be performed during other than regular work hours are indicated in the Drawings and/or the Specifications.

B. INTERRUPTION OF EXISTING FACILITIES:

1 The Contractor shall not interrupt any of the services of the facility nor interfere with such services in any way without the permission of the Commissioner. Such interruption or interferences shall be made as brief as possible, and only at such time stated.

2 Under no circumstances shall the Contractor, its subcontractors, or its workers, be permitted to use any part of the project as a shop, without the permission of the Commissioner.

3 Unnecessary noise shall be avoided at all times and necessary noise shall be reduced to a minimum.

4 Toilet facilities, water and electricity must be operational at all times (i.e. 24/7). No services of the facility can be interrupted in any way without the permission of the Commissioner. Careful coordination of all work with the Resident Engineer must be done to maintain the operational level of the project personnel at the facility.

5 The Contractor shall schedule the work to avoid noise interference that will affect the normal functions of the facility. In particular, construction operations producing noises that are objectionable to the functions of the facility must be scheduled at times of day or night, day of the week, or weekend, which will not interfere with personnel at the facility. Any additional cost resulting from this scheduling shall be borne by the Contractor.

6 The Contractor shall arrange to work continuously, including evening and weekend hours, if required, to assure that services will be shut down only during the time actually required to make the necessary connections to the existing facility.

7 The Contractor shall give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."

C. COMMISSIONING: Refer to the Addendum to identify whether this project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

1.2 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on the Project including without limitation the following.

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

B. This section includes the following:

1. Definitions
2. Coordination
3. Submittals
4. Administrative and Supervisory Personnel
5. Project Meetings
6. Requests for Interpretation (RFI's)
7. Correspondence
8. Contractor's Daily Reports
9. Alternate and Substitute Equipment

C. RELATED SECTIONS: include without limitation the following:

1. Section 01 10 00 SUMMARY
2. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
3. Section 01 33 00 SUBMITTALS
4. Section 01 35 26 SAFETY REQUIREMENTS
5. Section 01 73 00 EXECUTION REQUIREMENTS
6. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

7. Section 01 77 00 PROJECT CLOSEOUT PROCEDURES

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 COORDINATION:

A. Coordination: The Contractor shall coordinate its construction operations, including those of its subcontractors, with other entities to ensure the efficient and orderly installation of each part of the Work. The Contractor shall coordinate the various operations required by different Sections of the Specifications that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence in order to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. The Contractor shall prepare memoranda for distribution to its subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda shall include required notices, reports, and meeting minutes as applicable.

C. Administrative Procedures: The Contractor shall coordinate scheduling and timing of required administrative procedures with other construction activities and activities of its subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include without limitation the following:

1. Preparation of Contractor's Construction Schedule.
2. Installation and removal of temporary facilities and controls.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Pre-installation conferences..
6. Startup and adjustment of systems.
7. Project closeout activities.

D. Conservation: The Contractor shall coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Salvaged Items, Material and/or Equipment: The Specifications may identify certain items, materials or equipment which must be salvaged by the Contractor and handled or disposed of as directed. The Contractor shall comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

1.5 SUBMITTALS:

A. Submit shop drawings, product data, samples etc. in compliance with Section 01 33 00, SUBMITTAL PROCEDURES.

B. Coordination Drawings: The Contractor shall prepare applicable Coordination Drawings in compliance with the requirements for Coordination Drawings in Section 01 33 00, SUBMITTAL PROCEDURES.

C. Safety Plan in compliance with Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES.

D. Waste Management Plan in compliance with Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

E. Key Personnel Names: Within 15 days after the Notice to Proceed, the Contractor shall submit a list of key personnel assignments of the Contractor and its subcontractors, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in case of the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

2. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordinating all operations by its subcontractors.

1.6 PROJECT MEETINGS:

A. General: The Resident Engineer will hold regularly scheduled construction progress meetings at the site, at which time the Contractor and appropriate subcontractors shall have their representatives present to discuss all details relative to the execution of the work. The Resident Engineer shall preside over these meetings.

1. Agenda: Prior to each meeting, the Resident Engineer will consult with the Contractors and will prepare an agenda of items to be discussed. In general, after informal discussion of any item on the agenda, the Resident Engineer will summarize the discussion in a brief written statement, and the Contractor will then dictate a brief statement for the record.

2. Coordination: In addition to construction progress meetings called by the Resident Engineer, the Contractor shall hold regularly scheduled meetings for the purpose of coordinating; expediting and scheduling the work in accordance with the master coordinated Job Progress Chart. The Contractor and its subcontractors, material suppliers or vendors whose presence is necessary, are required to attend. These meetings may, at the discretion of the Contractor, be held at the same place and immediately following the project meetings held by the Resident Engineer. Minutes of these meetings shall be recorded, typed and printed by the Contractor and distributed to all parties concerned.

B. PRECONSTRUCTION KICK-OFF MEETING:

1. The Resident Engineer will schedule a preconstruction kick-off meeting either at DDC's main office or at the Project site to review responsibilities and personnel assignments and clarify the

role of each participant. Unless otherwise directed the Design Consultant will record and distribute meeting minutes.

2. Attendees: Authorized representative of the Client Agency; Design Consultant; the Contractor and its superintendents, subcontractor(s) and their superintendent(s); LEED sub-consultant and Commissioning Authority /Agent (CxA) as applicable and other concerned parties. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Contract Work.
3. Agenda: Includes without limitation the following as applicable:
   a. Establishing construction schedule
   b. Schedule for regular construction meetings
   c. Phasing
   d. Critical work sequencing and long-lead items
   e. Designation of key personnel and their duties
   f. Reviewing Application for Payment and Change Order Procedures
   g. Procedures for Requests for Information (RFIs.)
   h. Review Permits and Approval requirements
   i. Review all recent Administrative Code reporting requirements relating to the project, (i.e. LL 77, LL86 etc.)
   j. Procedures for testing and inspecting
   k. Reviewing special conditions at the Project site
   l. Distribution of the Contract Documents
   m. Submittal procedures
   n. Safety Procedures
   o. LEED requirements
   p. Commissioning Requirements
   q. Preparation of Record Documents
   r. Historic Treatment requirements
   s. Use of the premises
   t. Work restrictions
   u. Client Agency occupancy requirements
   v. Responsibility for temporary facilities, services and controls
   w. Construction Waste Management and Disposal
   x. Indoor Air Quality Management Plan
   y. Dust Mitigation Plan
   z. Office, work, and storage areas
   aa. Equipment deliveries and priorities
   bb. Security
   cc. Progress cleaning
   dd. Working hours

C. CONSTRUCTION PROGRESS MEETINGS:

1. The Resident Engineer will schedule and conduct construction progress meetings at bi-weekly intervals or as otherwise determined. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work. Unless otherwise directed the Design Consultant will record and distribute meeting minutes.
2. Attendees:
   a. Design Consultant and applicable sub-consultants
   b. Client Agency Representative
   c. Representatives from the Contractor, sub-contractor(s), suppliers or other entities involved in the current progress, planning, coordination or future activities of the Work
   d. Other appropriate DDC personnel, DDC consultants and concerned parties
3. Agenda: Includes without limitation the following:
   a. Review the Construction Schedule and progress of the Work. Determine if the Work is on time, ahead of schedule or behind schedule. Determine actions to be taken to maintain or accelerate the schedule
   b. Review and approve prior meeting minutes and follow up open issues
   c. Coordinate work between each subcontractor
   d. Sequence of Operations
   e. Status of submittals, deliveries and off-site fabrication
   f. Status of inspections and approvals by governing agencies
   g. Temporary facilities and controls
   h. Review Site Safety
   i. Quality and work standards
   j. Field observations
   k. Status of correction of deficient items
   l. RFI's
   m. Pending changes
   n. Status of outstanding Payments and Change Orders
   o. LEED requirements including Construction Waste Management, Indoor Air Quality Plan, Dust Mitigation and Commissioning
   p. Status of Administrative Code reporting requirements related to the project

1.7 REQUESTS FOR INFORMATION (RFI):

A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the Contractor shall prepare and submit an RFI in the form specified by the Resident Engineer.

1. RFI shall originate with the Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFI in a prompt manner to the Resident Engineer so as to avoid delays in Contractor's work or work of its subcontractors.
3. RFI Log: The Contractor shall prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Resident Engineer.

4. On receipt of responses and action to the RFI, the Contractor shall update the RFI log and immediately distribute the RFI response to affected parties. Review response(s) and notify the Resident Engineer immediately if the Contractor disagrees with response(s).

1.8 CORRESPONDENCE:

Copies of all correspondence to DDC shall be sent directly to the Resident Engineer at the job site.

1.9 CONTRACTOR'S DAILY REPORTS:

The Contractor shall prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the project and documenting the progress of construction during performance of the Work by developing, revising as necessary, various documents including but not limited to the following:

1. Baseline Construction Schedule.
2. Composite Schedule for entire project
3. Recovery Composite Schedule
4. Revised and/or updated Composite Schedule
5. Submittals Schedule.
6. Daily construction reports.
7. Material location reports.
8. Field condition reports.
9. Special reports.

B. RELATED SECTIONS: include without limitation the following:

1. Section 01 10 00 SUMMARY
2. Section 01 32 22 PHOTOGRAPHIC DOCUMENTATION
3. Section 01 33 00 SUBMITTAL PROCEDURES
4. Section 01 40 00 QUALITY REQUIREMENTS

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Baseline Construction Schedule:
A horizontal bar chart type schedule (Microsoft Project OR similar program) listing all the activities and their duration for entire contract duration OR construction period, including logical ties and interrelations between the activities necessary for the timely and successful completion of the project. Critical path activities shall be clearly marked. The Baseline construction schedule is a preliminary schedule that must be reviewed and approved by the Resident Engineer.

D. Composite Schedule:
A composite horizontal bar chart type schedule (Microsoft Project OR similar program) listing all activities to be performed by the Contractor and its subcontractors, the duration of each activity including logical ties and interrelations between activities, and the sequence of each of necessary activities for the timely and successful completion of the project within the stipulated contract duration. Critical path activities shall be clearly marked. The Composite schedule must be signed and submitted by the Contractor within thirty (30) calendar days after the date established for commencement of the Contract, unless otherwise directed. The Composite Schedule must be reviewed and approved by the Resident Engineer.

E. Recovery Composite Schedule: A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order.

A Composite Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the project within the stipulated contract duration, plus authorized time extensions. In such case special attention must be given to keep the delays as minimum as possible and must establish the nature of efforts such as extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its subcontractors, consultants, clients, end users and/or other concerned parties.

Such schedule must be prepared and submitted within Five (5) calendar days of request by the Resident Engineer. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.

F. Revised and/or Updated Composite Schedule:

A Baseline construction schedule OR Composite Schedule OR Recovery Composite Schedule for the project that shows the actual duration of all the completed activities, including duration of and the reasons for delays, if any has occurred, AND revisions to all remaining activities of the Contractor and its subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined activities. Any such revisions should be shown on the row just below the approved schedule of the respective activity so that revisions can be compared.

The Revised and/or updated Composite Schedule must be reviewed and approved by the Resident Engineer.

G. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

H. Event: The starting or ending point of an activity.

I. Fragment: A part of the activity that breaks down activities into smaller activities for greater detail.

J. Milestone: A key or critical point in time for reference or measurement.

K. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

PART II – PRODUCTS

2.1 BASELINE CONSTRUCTION SCHEDULE:

A. The Contractor shall prepare a Baseline horizontal bar-chart-type construction schedule for the project. Submit the Baseline Construction Schedule to the Resident Engineer within (15) fifteen calendar days after the date established for commencement of the Contract, unless directed otherwise. The Baseline Schedule must be reviewed and approved by the Resident Engineer.

1. Provide a separate time bar for each significant construction activity. Coordinate each activity on the schedule with other construction activities for proper interrelationship & sequence.
2. Duration: The duration of each activity on the schedule besides installation must clearly show required duration of filing for permits, inspections, testing, approvals, shop drawings and materials submittals and approvals, fabrication, delivery, phasing for each construction activity.
3. Schedule shall be time-scaled in not more than weekly increments, with the dates of the first day (Monday) of each week indicated.
4. Completion of all the project activities shall be indicated in advance of the date established for completion of the Contract, allowing time for required inspection and punch list work.
5. Clearly show time bar for all the tasks, to be completed before start of physical work of scheduled activities, including but not limited to obtaining required permit, subcontractor approval, submission and approval of shop drawings, field verification, time for fabrication and delivery, testing of materials and/or samples, preparation and approval of mock-up sample, curing, pre-testing of soil, pre-testing of equipment - including start up, testing & adjusting, filing for inspection by regulatory agencies, training, final use, etc. required to maintain orderly progress of the activity. A special consideration must be given to those activities requiring early approvals because of long lead-time for manufacture or fabrication.
6. Phasing: Arrange all activities in proper sequence to reflect requirements for phased completion, work by other entities, work by the City, City furnished items, coordination with existing work, limitations arising due to continued occupancies, non-interruptible services, partial completion for occupancy, site restrictions, provisions for future work, seasonal variations, environmental control, and similar conditions of the project.
7. Arrange all activities and/or show interrelationship and logical sequence of all activities, determine and mark all critical path activities including any phasing reflecting actual project condition.
8. Keep at least two blank horizontal bars between all activities for recording actual progress and submitting Revised Schedule as defined in Sub-Section 1.3 G
9. If necessary a new revised schedule shall be prepared in the same manner as outlined above.

2.2 COMPOSITE SCHEDULE FOR THE PROJECT:

A. The Contractor shall prepare a Composite Schedule based on the approved Baseline Schedule Such schedule shall indicate graphically and chronologically the start and completion of each and every activity, including all the pre-activity and post activity tasks. Keep at least two blank horizontal bars between all activities for recording actual progress and/or revisions.

1. If necessary the Contractors shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Composite Schedule. The Composite Schedule must be finalized and signed by the Contractor within (30) thirty calendar days after the date established for commencement of the Contract, unless directed otherwise. The Composite Schedule must be reviewed and approved by the Resident Engineer.

2.3 RECOVERY COMPOSITE SCHEDULE:

A. A Recovery Composite Schedule is not required unless the City issues an Acceleration Change Order. A Recovery Composite Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the project within the stipulated contract duration, plus authorized time extensions, must be developed and submitted within (5) five calendar days of the request by the Resident Engineer. Such Recovery Composite Schedule shall include all information as defined in Article 1.3 F and shall be prepared in the same manner as outlined in Sub-Sections 2.1 and 2.2. The Recovery Composite Schedule must be reviewed and approved by the Resident Engineer.

2.4 REVISED AND/OR UPDATED COMPOSITE SCHEDULE:

A. The Contractor shall revise and/or update the approved Composite Schedule as directed. The Revised schedule shall be prepared in the same manner as outlined above in Sub-Sections 2.1 and 2.2.

B. The Contractor shall mark actual progress, delays, work stoppage etc. in the row just below the approved schedule for the respective activity so that revisions can be compared.

C. Such schedule also shall indicate graphically and chronologically any revisions to the start and completion of the remaining activities including revisions to all the pre-activity and post activity tasks for all subcontractors.

D. If necessary, the Contractor shall meet with each subcontractor and with the Resident Engineer to review and make warranted adjustments and finalize the Revised Composite Schedule. Once the schedule is finalized, the Contractor shall sign and date a reproducible form of the Schedule. Such schedule must be prepared and submitted by the Contractor within Five (5) calendar days of request by the Resident Engineer. The Revised Composite Schedule must be reviewed and approved by the Resident Engineer.

2.5 SUBMITTALS SCHEDULE:

A. Preparation: The Contractor shall submit a schedule of submittals, arranged in chronological order by dates required by the construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

B. SCHEDULE F: Schedule F sets forth all submittal requirements for shop drawings and material samples. Schedule F is included in the Addendum. At the kick-off meeting, the Contractor must review this Schedule with the Resident Engineer and the Design Consultant. Within 10 days after the kick-off meeting, the Contractor must complete information on Schedule F concerning the submission date, the required delivery date and the fabrication time. For all required submittals of shop drawings and material samples, the Schedule F provided by the Contractor must indicate a submission date which is at least 20 business days prior to the date of the manufacture of the item or materials to be installed. In addition, if so directed by the Commissioner, the Schedule F provided by the Contractor must indicate a submission date for shop drawings and/or material samples of specified items or materials which is within 60 business days after the kick-off meeting. In the event of any conflict between the Specifications and Schedule F, Schedule F shall take precedence; provided, however, in the event of an omission from Schedule F (i.e., Schedule F omits either a reference to or information concerning a submittal requirement which is set forth in the Specifications), such omission from Schedule F shall have no effect and the Contractor's submittal obligation, as set forth in the Specifications, shall remain in full force and effect.

C. Review: The Resident Engineer will review the Schedule F submitted by Contractor. Upon acceptance, the Resident Engineer will date and sign the schedule as approved and transmit it to the Consultant, Contractor and others within DDC as he/she deems appropriate.

2.6 REPORTS:

A. Daily Construction Reports: The Contractor shall submit to the Resident Engineer written Daily Construction Reports at the end of each work day, recording basic information such as the date, day, weather conditions, and contract days passed, remaining contract duration/days and the following information concerning the Project.

Information: The reports shall be prepared by the Contractor's Superintendent and shall bear the Contractor's Superintendents signature. Each report shall contain the following information:

1. List of name of Contractor, subcontractors, their work force in each category, and details of activities performed.
2. The type of materials and/or major equipment being installed by the Contractor and/or by each subcontractor.
3. The major construction equipment being used by the Contractor and/or subcontractors.
4. Material and Equipment deliveries.
5. High and low temperatures and general weather conditions.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings
11. Emergency procedures.
12. Orders and/or requests of authorities having jurisdiction.
13. Approved Change Orders received and implemented.
14. Field Orders and Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial Completions and occupancies.
18. Substantial Completions authorized.

NOTE: If there is NO ACTIVITY at site, a daily report indicating so and the reason for no activity at the site must be submitted.

B. Material Location Reports: The contractor shall submit a Material Location Report at weekly OR monthly intervals as determined and established by the Resident Engineer. Such report shall include a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit a Request For Information (RFI) form with a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.7 SPECIAL REPORTS:

A. Accident report, incident report, special condition report for the conditions out of control of any party involved with the project effecting project progress, explaining impact on the project schedule and cost if any.

PART III – EXECUTION (Not Used)
END OF SECTION 01 32 00

No Text

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 33

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract]

1.2 SUMMARY:

A. This Section includes the following:
1. Photographic Media
2. Construction Photographs
3. Pre-construction Photographs
4. Periodic Construction Progress Photographs
5. Special Photographs
6. DVD Recordings
7. Final Completion Construction Photographs

B. RELATED SECTIONS: include without limitation the following:

1.	Section 01 10 00	SUMMARY
2.	Section 01 33 00	SUBMITTAL PROCEDURES
3.	Section 01 35 91	HISTORIC TREATMENT PROCEDURES
4.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
5.	Section 01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

C. PHOTOGRAPHER - The Contractor shall employ and pay for the services of a professional photographer who shall take photographs showing the progress of the work for all Contracts.

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SUBMITTALS:

A. Qualification Data: For photographer.

B. Key Plan: With each Progress Photograph Submittal include a key plan of Project site and building with notation of vantage points marked for location and direction of each image. Indicate location, elevation or story of construction. Include same label information as corresponding set of photographs.

C. Construction Progress Photograph Prints: Take Progress Photographs bi-weekly and submit four color prints of each photographic view for each trade to the Resident Engineer. Such photographs shall be included in each monthly progress report or as otherwise directed by the Resident Engineer.

D. Construction Photograph Negatives: Submit a complete set of photographic negatives in individually protected negative sleeves with each submittal of prints. Identify negatives with label matching photographic prints.

E. Digital Images: If Digital Media is used, submit a complete set of digital color image electronic files on CD-ROM with each submittal of prints. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, un-cropped.

1.5 QUALITY ASSURANCE:

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.6 COORDINATION:

A. The Contractor and its subcontractor(s) shall cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.7 COPYRIGHT:

A. The Contractor shall include the provisions set forth below in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this section. The Contractor shall submit to the Resident Engineer a copy of its agreement with the Photographer.

B. Any photographs, images and/or other materials produced pursuant to this Agreement, and any and all drafts and/or other preliminary materials in any format related to such items produced pursuant to this Agreement, shall upon their creation become the exclusive property of the City.

C. Any photographs, images and/or other materials provided pursuant to this Agreement ("Copyrightable Materials") shall be considered "work-made-for-hire" within the meaning and purview of Section 101 of the United States Copyright Act, 17 U.S.C. § 101, and the City shall be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might exist. To the extent that the Copyrightable Materials do not qualify as "work-made-for-hire," the Photographer hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to the Copyrightable Materials to the City, free and clear of any liens, claims, or other encumbrances. The Photographer shall retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials shall be used by the Photographer for no purpose other than in the performance of this Agreement without the prior written permission of the City. The Department may grant the Photographer a license to use the Copyrightable Materials on such terms as determined by the Department and set forth in the license.

D. The Photographer acknowledges that the City may, in its sole discretion, register copyright in the Copyrightable Materials with the United States Copyright Office or any other government agency authorized to grant copyright registrations. The Photographer shall fully cooperate in this effort, and agrees to provide any and all documentation necessary to accomplish this.

E. The Photographer represents and warrants that the Copyrightable Materials: (i) are wholly original material not published elsewhere (except for material that is in the public domain); (ii) do not violate any copyright Law; (iii) do not constitute defamation or invasion of the right of privacy or publicity; and (iv) are not an infringement, of any kind, of the rights of any third party. To the extent that the Copyrightable Materials incorporate any non-original material, the Photographer has obtained all necessary permissions and clearances, in writing, for the use of such non-original material under this Agreement, copies of which shall be provided to the City.

PART II – PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

A. Photographic Film: Medium format, 2-1/4 by 2-1/4 inches (60 by 60 mm).

B. Digital Images:

1. Construction Progress Images: Color images in JPEG format with minimum sensor size of 1.3 megapixels.

2. Presentation Quality Images: Provide Color images in uncompressed TIFF format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 with 8"x10" original capture at 300 dpi or greater.

C. Prints:

1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte color prints on single-weight commercial-grade stock paper, with 1inch wide margins and punched for standard 3-ring binder.

2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
   a. Project Contract I.D. Number.
   b. Project Contract Name.
   c. Name of Contractor. (and Subcontractor Trade Represented)
   d. Subject of Image Taken.
   e. Date and time photograph was taken if not date stamped by camera.
   f. Description of vantage point, indicating location, direction and other pertinent information.
   g. Unique sequential identifier.
   h. Name and address of photographer.

PART III – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location and direction of view.

B. Film Images:

1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Commissioner.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.

2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Commissioner.

3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

A. Before commencement of Contract work at the site, take color photographs of Project site and surrounding properties, including existing structures or items to remain during construction, from different vantage points, as directed by the Resident Engineer.

1. Flag applicable excavation areas and construction limits before taking construction photographs.

2. Take photographs of minimum eight (8) views to show existing conditions adjacent to property before starting the Work.

3. Take applicable photographs of minimum eight (8) views of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.

4. Take additional photographs as required or directed by the Resident Engineer to record settlement or cracking of adjacent structures, pavements, and improvements.

B. Demolition Operations: Take photographs as directed by the Resident Engineer of minimum of eight (8) views each before commencement of demolition operations, at mid-point of operations and at completion of operations.

C. Pre-Demolition Photographs: Take archival quality color photographs, to include all exterior building facades, of all structures at the Project site designated to be fully demolished or removed in compliance with NYC Building Code requirements. Submit four (4) complete sets of pre-demolition photographs, in the format specified herein, to the Resident Engineer for submission to the Department of Buildings.

3.3 PERIODIC CONSTRUCTION PROGRESS PHOTOGRAPHS:

A. Take photographs of minimum eight (8) views bi-weekly as directed by the Resident Engineer of construction progress for each contract trade. Select vantage points to show status of construction and progress since last photographs were taken.

3.4 SPECIAL PHOTOGRAPHS:

A. The photographer shall take special photographs of subject matter or events as specified in other sections of the Project Specifications from vantage points specified or as otherwise directed by the Resident Engineer.

B. Historical Elements: As required in Section 01 35 91, HISTORIC TREATMENT PROCEDURES, for Contract work at designated landmark structures or sites the photographer, as specified and required by individual sections of the Contract documents or at the direction of the Commissioner, shall take images of existing elements scheduled to be removed for replacement, repair or replication in quantities as directed, including post-construction photographs of completed work as directed by the Commissioner.

1. Take Presentation Quality Photographs of designated landmark structures as directed by the Commissioner for submission to the New York City Landmarks Preservation Commission. Provide a minimum of four color photographic prints of each view as directed.

3.5 DVD RECORDING:

A. When DVD Recording of Demonstration and Training sessions is required for Non-Commissioned projects the Contractor shall provide the services of a Videographer as indicated in Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

3.6 FINAL COMPLETION CONSTRUCTION PHOTOGRAPHS:

A. Take color photographs of minimum eight (8) unobstructed views of the completed project or project and site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning is done after date of Substantial Completion for submission as Project Record Documents. Submit four (4) sets of each view of Presentation Quality photographic prints including negatives and/or digital images electronic file.

END OF SECTION 01 32 33

No Text

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART I – GENERAL:

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Coordination Drawings, Catalogue Cuts, Material Samples and other submittals required by the Contract Documents.

B. Review of submittals does not relieve the Contractor of responsibility for any Contractor's errors or omissions in such submittals, nor from responsibility for complying with the requirements of the Contract.

C. Responsibility of the Contractor: The approval of Shop Drawings will be general and shall not relieve the Contractor of responsibility for the accuracy of such Shop Drawings, nor for the proper fitting and construction of the work, nor of the furnishing of materials or work required by the Contract and not indicated on the Shop Drawings. Approval of Shop Drawings shall not be construed as approving departures from the Contract Drawings, Supplementary Drawings or Specifications.

D. This Section includes the following:
1. Definitions
2. Submission Procedures
3. Coordination Drawings
4. LEED Submittals
5. Ultra Low Sulfur Diesel Fuel Reporting
6. Construction Photographs and DVD Recordings
7. As-Built Documents

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
C.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
D.	Section 01 32 33	PHOTOGRAPHIC DOCUMENTATION
E.	Section 01 77 00	CLOSEOUT PROCEDURES
F.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
G.	Section 01 81 13	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or

combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Submittals: Written and graphic information that requires responsive actions and includes without limitation all shop drawings, product data, letters of certification, tests and other information required for quality control and as required by the Contract Documents.

D. Informational Submittals: Written information that does not require responsive action. Submittals may be rejected for non-compliance with the Contract.

E. Shop Drawings: Include drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, except for coordination drawings, specifically prepared for the project by the Contractor or any subcontractor, manufacturer, supplier or distributor, which illustrates how specific portions of the work shall be fabricated and/or installed.

F. Coordination Drawings: As required in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

G. Product Data and Quality Assurance Submittals: Includes manufacturer's standard catalogs, pamphlets and other printed materials including without limitation the following:

1. Catalogue and Product specifications
2. Installation instructions
3. Color charts
4. Catalog cuts
5. Rough-in diagrams and templates
6. Wiring diagrams
7. Performance curves
8. Operational range diagrams
9. Mill reports
10. Design data and calculations
11. Certification of compliance or conformance
12. Manufacturer's instructions and field reports

1.5 COORDINATION DRAWINGS:

A. The Contractor shall provide reproducible Coordination Drawing(s) of the reflective ceiling showing the integration of all applicable contract work, including general construction work as well as trade work (Plumbing, HVAC, and Electrical) to be performed by subcontractors. The Coordination Drawing(s) shall include, without limitation, the following information:
   1. General Construction work showing the reflective ceiling plan including starting points, ceiling and beam soffits elevations, ceiling heights, roof openings, etc.
   2. HVAC Contract work showing ductwork, heating and sprinkler piping, location of grilles, registers etc. and access doors in hung ceilings. Locations shall be fixed by elevations and dimensions from column centerlines and/or walls.
   3. Plumbing Contract work including piping, valves, cleanouts etc., indicating locations and elevations and shall indicate the necessary access doors.
   4. Electrical Contract work indicating fixtures, large conduit runs, clearances, pull boxes, junction boxes, sound system speakers, etc.

B. The Contractor shall issue the completed Coordination Drawing(s) to the Resident Engineer for his/her review. The Resident Engineer may call as many meetings as necessary with the Contractor, including

attendance by applicable subcontractors, and may call on the services of the Design Consulting where necessary, to resolve any conflicts that become apparent.

C. Upon resolution of any conflicts, the Contractor shall provide a final Coordination Drawing(s) which will become the Master Coordination Drawing(s). The Master Coordination Drawing(s) shall be signed and dated by the Contractor to indicate acceptance of the arrangement of the work.

D. A reproducible copy of the Master Coordination Drawing(s) shall be provided by the Contractor to each of the appropriate subcontractor(s), the Resident Engineer and the Design Consultant for information.

E. Shop Drawings shall not be submitted prior to acceptance of the final coordinated drawings and shall be prepared in accordance with the Master Coordination Drawing(s). No work will be permitted without accepted Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.

1.6 SUBMITTAL PROCEDURES:

A. Refer to Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS and Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS for additional submittal requirements involving electrical and mechanical work or equipment of any nature called for the project.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activities, with the Submittal Schedule specified in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
3. The Commissioner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Submittals Schedule: The Submittals Schedule is set forth in Schedule F, which is included in the Addendum.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Design Consultant.
3. Include the following minimum information on label for processing and recording action taken:
   a. Project name, DDC Project Number and Contract Number
   b. Date
   c. Name and address of Design Consultant
   d. Name and address of Contractor
   e. Name and address of subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Submittal number or other unique identifier, including revision identifier
   i. Number and title of appropriate Specification Section
   j. Drawing number and detail references, as appropriate
   k. Location(s) where product is to be installed, as appropriate
   l. Other necessary identification

E. Transmittal:

1. Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form in triplicate. Transmittals received from sources other than the

Contractor will be returned without review. Re-submission of the same drawings or product data shall bear the original number of the prior submission and the original titles.

2. Transmittal Form: Provide locations on form for the following information:

   a. Project name, DDC Project number and Contract Number
   b. Date
   c. Destination (To:)
   d. Source (From:)
   e. Names of Contractor, subcontractor, manufacturer, and supplier
   f. Category and type of submittal
   g. Submittal purpose and description
   h. Specification Section number and title
   i. Drawing number and detail references, as appropriate
   j. Transmittal number, numbered consecutively
   k. Submittal and transmittal distribution record
   l. Remarks
   m. Signature of transmitter

F. Shop Drawings:

1. Procedures for Preparing, Forwarding, Checking and Returning all Shop Drawings shall be, generally, as follows:

   a. The Contractor shall make available to its subcontractors the necessary Contract Documents and shall instruct such subcontractor to determine dimensions and conditions in the field, particularly with reference to coordination between the trade subcontractors. The Contractor shall direct its subcontractors to prepare Shop Drawings for submission to the Design Consultant in accordance with the requirements of these General Conditions. The Contractor shall also direct its subcontractors to "Ring Up" corrections made on all re-submissions for approval, so as to be readily seen, and that the symbol "sub" be used to identify the source of the correction or information that has been added.

      The Contractor shall:

      1. Review and be responsible to the Commissioner, for information shown on its subcontractor's Shop and Installation drawings and manufacturers' data, and also for conformity to Contract Documents.
      2. "Ring Up" corrections made on all submissions for approval, so as to be readily seen, and that the symbol "GC", "PL", "HVAC" or "EL" be used to indicate that the correction and/or information added was made by the Contractor and/or its subcontractor(s).
      3. Clearly designate which entity is to perform the work when the term, "work by others" or other similar phrases are indicated on the Contract Drawings before submission to the Design Consultant.
      4. Stamp submissions "Recommended for Acceptance", date and forward to the Design Consultant.

2. The Contractor shall promptly prepare and submit project specific layout detail and Shop Drawings of such parts of the work as are indicated in the Specifications, Schedule F of the Addendum or as required. These Shop Drawings shall be made in accordance with the Contract Drawings, Specifications and Supplementary Drawings, if any. The Shop Drawings shall be accurate and distinct and give all the dimensions required for the fabrication, erection and installation of the work.

3. Size of Drawings: The Shop Drawings, unless otherwise directed, shall be on sheets of the same size as the Contract Drawings, drawn accurately and of sufficient scale to be legible, with a one half (1/2) inch marginal space on each side and a two (2) inch marginal space for binding on the left side.

4. Scope of Drawings: Shop Drawings shall be numbered consecutively and shall accurately and distinctly represent all aspects of the work, including without limitation the following:

   a. All working and erection dimensions
   b. Arrangements and sectional views
   c. Necessary details, including performance characteristics, and complete information for making necessary connections with other work
   d. Kinds of materials including thickness and finishes
   e. Identification of products
   f. Fabrication and installation drawings
   g. Roughing-in and setting diagrams
   h. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
   i. Shop work manufacturing instructions
   j. Templates and patterns
   k. Schedules
   l. Design calculations
   m. Compliance with specified standards
   n. Notation of coordination requirements
   o. Notation of dimensions established by field measurement
   p. Relationship to adjoining construction clearly indicated
   q. Seal and signature of professional engineer if specified
   r. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring
   s. All other information necessary for the work and/or required by the Commissioner

5. Titles and Reference: Shop Drawings shall be dated and contain:
   a. Name of the Project, DDC Project Number and Contract Number
   b. The descriptive names of equipment, or materials covered by the Contract Drawings and the classified item number or numbers, if any, under which it is, or they are required
   c. The locations or points and sequence at which materials, or equipment, are to be installed in the work
   d. Cross references to the section number, detail number and paragraph number of the Contract Specifications
   e. Cross references to the sheet number, detail number, etc., of the Contract Drawings

6. Field Measurements: In addition to the above requirements, the Shop Drawings shall be signed by the Contractor and, if applicable, the subcontractor responsible for preparation of the Shop Drawings. Each Shop Drawing shall be stamped with the following wording:

   FIELD MEASUREMENTS: The Contractor certifies that it has verified and supplemented the Contract Drawings by taking all required field measurements, which said measurements correctly reflect all field conditions and that this Shop Drawing incorporates said measurements.

7. Contractor's Statement with Submittal: Any Submittal by the Contractor for acceptance, including without limitation, all dimensional drawings of equipment, blueprints, catalogues, models, samples and other data relative to the equipment, the materials, the work or any part thereof, must be accompanied by a statement that the Submittal has been examined by the Contractor and that everything shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If there is any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, the Contractor shall, in its statement, list and clearly describe each such discrepancy.

   Acceptance will be given based upon the Contractor's representation that what is shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If

the Contractor's statement indicates any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, such change is subject to review and prior written acceptance by the Design Consultant. In addition, such change may require a change order in accordance with Article 25 of the Contract. In the event any such change is approved, any additional expense or increased cost in connection with the change is the sole responsibility of the Contractor.

8. Submission of Shop Drawings:

   a. Initial Submission: The Contractor shall submit seven (7) copies of each Shop Drawing to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Shop Drawings to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory Shop Drawing will be stamped "No Exceptions Taken", be dated and distributed by the Design Consultant as follows:
      1) Two (2) copies thereof will be returned to the Contractor by letter
      2) Three (3) copies of the approved Shop Drawing and copy of the transmittal letter to the Contractor will be forwarded to DDC
      3) One copy will be retained by the Design Consultant
      4) One copy will be forwarded / retained by sub-consultant(s) as appropriate

      Should the Shop Drawing(s) be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will return the Shop Drawings to the Contractor with the necessary corrections and changes to be made as indicated thereon.

   b. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each shop drawing to the Design Consultant. The Contractor shall revise and resubmit the Shop Drawing as required by the Design Consultant until the Shop Drawings are stamped "No Exceptions Taken". However, Shop Drawings which have been stamped "Make Corrections Noted" shall be considered an "Acceptable" Shop Drawing and NEED NOT be resubmitted.

   c. Commencement of Work: No work or fabrication called for by the Shop Drawings shall be done until the acceptance of the said drawings by the Design Consultant is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractor's subcontractors which Shop Drawing indicated work related to, adjacent to, impinging upon, or affecting work to be done by other subcontractors shall be transmitted to the subcontractors so affected. [These accepted Shop Drawings shall be distributed to the affected subcontractors when required with a copy of the transmittal to the Resident Engineer.]

   d. Variations: If the Shop Drawings show variations from the Contract requirements because of standard shop practice or other reasons, the Contractor shall make specific mention of such variations in its letter of submittal. Acceptance of the Shop Drawings shall constitute acceptance of the subject matter thereof only and not of any structural apparatus shown or indicated.

G. Product Data:

1. General: Except as otherwise prescribed herein, the submission, review and acceptance of Product Data and Catalogue cuts shall conform to the procedures specified in Sub-Section 1.6 F, Shop Drawings.

2. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

3. Mark each copy of each submittal to show which products and options are applicable.

4. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

5. Submit Product Data before or concurrent with Samples.

6. Submission of Product Data:

   a. Initial Submission: The Contractor shall submit seven (7) sets of Product Data to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Product Data to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory catalogue cut will be stamped "No Exception Taken", be dated and distributed as follows:

      1) Two (2) copies thereof will be returned to the Contractor by letter

      2) Three (3) copies of the Product Data and copy of the transmittal letter to the Contractor will be forwarded to DDC

      3) One copy will be retained by the Design Consultant

      4) One copy will be forwarded / retained by sub-consultant(s) as appropriate

      Should the Product Data be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will return one (1) set of such Product Data to the Contractor with the necessary corrections and changes to be made indicated and one (1) set to DDC.

7. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each Product Data for the review of the Design Consultant. The Contractor shall revise and resubmit the Product Data as required by the Design Consultant until the submission is stamped "No Exceptions Taken" by the Design Consultant. However, Product Data which has been stamped "Make Corrections Noted" shall be considered an "Accepted" Product Data and NEED NOT be resubmitted.

H. Samples of Materials:

1. For samples of materials involving electrical work of any nature, refer to Section 00 35 06 - General Electrical Requirements.

2. Samples shall be in triplicate, of sufficient size to show the quality, type, range of color, finish and texture of the material.

3. Each of the samples shall be labeled as follows:

   a. Name of the Project, DDC Project Number and Contract Number
   b. Name and quality of the material
   c. Date

d. Name of Contractor, subcontractor, manufacturer and supplier
e. Related Specification or Contract Drawing reference to the samples submitted

4. A letter of transmittal, in triplicate, from the Contractor requesting acceptance must accompany all such samples.

5. Transportation charges to the Design Consultant's office must be prepaid on all samples forwarded.

6. Samples for testing purposes shall be as required in the Specifications.

7. Samples on Display: When samples are specified to be equal to approved product, they shall be carefully examined by the Contractor and by those whom the Contractor expects to employ for the furnishing of such materials.

8. Timely Submissions Log/Schedule: Samples shall be submitted in accordance with approved Shop Drawing log so as to permit proper consideration without delaying any operation under the project. Materials should not be ordered until acceptance is received, in writing, from the Design Consultant. All materials shall be furnished equal in every respect to the accepted samples.

9. The Acceptance of any samples will be given as promptly as possible, and shall be only for the characteristic color, texture, strength, or other feature of the material named in such approval, and no other. When this approval is issued by the Design Consultant, it is done with the distinct understanding that the materials to be furnished will fully and completely comply with the Specifications, the determination of which may be made at some later date by a laboratory test or by other procedure. Use of materials will be permitted only so long as the quality remains equal to the approved samples and complies in every respect with the Specifications, and the colors and textures of the samples on file in the office of the Design Consultant, for the project.

10. Acceptability of test Data: The Commissioner will be the final judge as to acceptability of laboratory test data and performance in service of materials submitted.

11. Valuable Samples: Valuable samples, such as hardware, plumbing and electrical fixtures, etc., not destroyed by inspection or test, will be returned to the Contractor and may be incorporated into the work after all questions of acceptability have been settled, providing suitable permanent records are made as to the location of the samples, their properties, etc.

12. Equivalent Quality: Any material, article and/or equipment which is designated in the Drawings and/or Specifications by a number in the catalogue of any manufacturer or by a manufacturer's grade or trade name is designated for the purpose of describing the material, article and/or equipment and fixing the standard of performance and/or function, as well as the quality and/or finish. Any material, article and/or equipment which is other than what is specified in the Drawings and/or Specifications will only be accepted if the Commissioner makes a written determination that such material, article and/or equipment is equivalent to that which is specified in the Drawings and/or Specifications.

13. The submission of any material, article and/or equipment as the equal of any material, article and/or equipment set forth in the Drawings and/or Specifications as a standard shall be accompanied by any and all information essential for determining whether such proposed material, article and/or equipment is equivalent to that which is specified. Such information shall include, without limitation, illustrations, drawings, descriptions, catalogues, records of tests, samples, as well as information regarding the finish, durability and satisfactory use of such proposed material, article and/or equipment under similar operating conditions.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7

1.7 LEED SUBMITTALS:

A. Comply with submittal requirements specified in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL; Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS; Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS; Section 01 81 19, INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS and Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.

B. LEED Building submittal information shall be assembled into one package per each applicable specification section, separate from all other non-LEED submittals. Each submittal package shall have a separate transmittal and identification as described in Sub-Section 1.5 herein.

C. Number of Copies: Submit FOUR (4) copies of LEED submittals, in accordance with procedure described in Article 1.5 herein, unless otherwise indicated.

D. Material Safety Data Sheets (MSDSs) for LEED Certification: Submit information necessary to show compliance with LEED certification requirements, which will be the limit of the Design Consultant's review for LEED compliance.

1. Designated LEED submittals that include non-LEED MSDS data will not be reviewed. The entire submittal will be returned for re-submission.

E. Product Cut Sheets and/or Shop Drawings for LEED Certification: Provide product cut sheets and/or shop drawings with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project. For detailed requirements refer to Sub-Section 1.6 of Section 01 81 13 SUSTAINALE DESIGN REQUIREMENTS FOR LEED PROJECTS.

1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Sub-Section 1.6 of Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED PROJECTS.

1.8 ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:

A. In accordance with Section 01 10 00 Summary, Sub-Section 1.5 E, the Contractor shall submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel and Best Available Technology (BAT) in Non road Vehicles. Submission of such reports shall be in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.9 CONSTRUCTION PHOTOGRAPHS AND DVD RECORDINGS:

A. Submit construction progress photographs and DVD recordings in accordance with requirements of Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION

1.10 AS-BUILT DOCUMENTS:

A. Submit all as-built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 35 03
GENERAL MECHANICAL REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. The General Mechanical Requirements contained herein 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 Contractors shall submit, as directed, Mechanical Shop Drawings, roughing drawings, manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1. Submit sheet metal shop standards. Submit manufacturer's product data including gauges, materials, types of joints, scaling materials and installations for metal ductwork materials and products.

2. Submit scaled layout drawing (3/8"=1') of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, slopes of horizontal runs, wall and floor penetrations and connections. Show modifications of indicated requirements made to conform to local shop practice and how those modifications ensure that free area, materials and rigidity are not reduced. Layouts should include all the room plans, mechanical equipment rooms and penthouses. Method of attachment of duct hangers to building construction all with the support details. Coordinate shop drawings with related trades prior to submission.

3. Indicate duct fittings, particulars such as gauges, sizes, welds and configuration prior to start of work for low-pressure systems.

4. Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data and shop drawings in maintenance manual.

1.6 ACCESSIBILITY:

All work shall be installed by the Contractor so as to be readily accessible for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they shall not be made without approval by the Commissioner.

1.7 CHANGES IN PIPING, DUCTS, AND EQUIPMENT:

Wherever field conditions are such that for proper execution of the work, reasonable changes in location of piping, ducts and equipment are necessary and required, the Contractor shall make such changes as directed and approved, without extra cost to the City.

1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:

Piping, ducts and equipment shall be thoroughly cleaned by the Contractor of all dirt, cuttings and other foreign substances. Should any pipe, duct or other part of the several systems be obstructed by any foreign matter, the Contractor will be required to pay for disconnecting, cleaning and reconnecting wherever necessary for the purpose of locating and removing obstructions. The Contractor shall pay for repairs to other work damaged in the course of removing obstructions. For work on existing piping, ducts and equipment the Contractor shall pay special attention during this task so as not to disturb the insulation on such piping, ducts or equipment.

1.9 STANDARDIZATION OF SIMILAR EQUIPMENT:

Unless otherwise particularly specified, all equipment of the same kind, type or classification, and used for identical purposes, shall be the product of one (1) manufacturer.

1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:

Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor shall be designed by an Engineer licensed in New York State retained by the Contractor. Supporting structures shall be built by the Contractor of sufficient strength to safely withstand all stresses to which they may be subjected, within permissible deflections, and shall meet the following standards:

A. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.

B. Concrete for supports for equipment shall conform to the Specifications for concrete herein, but in no case shall be less than the requirements of the New York City Construction Codes for average concrete.

C. Steel reinforcement for concrete shall be of intermediate grade and shall meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.

D. Drawings and calculations shall be submitted for review and acceptance in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.11 ELIMINATION OF NOISE:

A. All systems and/or equipment provided under the Contract shall operate without objectionable noise or vibration.

B. Should operation of any one or more of the several systems produce noise or vibration which is, in the opinion of the Commissioner, objectionable, the Contractor shall at its own expense make changes in piping, equipment, etc. and do all work necessary to eliminate objectionable noise or vibration.

C. Should noise or vibration found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from systems and/or equipment installed under the Contract, the Contractor shall at its own expense install such insulators and make such changes in or additions to the installations as may be necessary to prevent transmission of this noise or vibration.

1.12 PRELIMINARY FIELD TEST:

As soon as conditions permit, the Contractor shall furnish all necessary labor and materials for, and shall make, preliminary field tests of the equipment to ascertain compliance with the requirements of the Contract. If the preliminary field tests disclose equipment that does not comply with the Contract, the Contractor shall, prior to the acceptance test, make all changes, adjustments and replacements required.

1.13 INSTRUCTIONS ON OPERATION:

At the time the equipment is placed in permanent operation by the City, the Contractor shall make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor shall instruct the City's operating personnel on the proper maintenance and operation of the equipment for the period of time called for in the Specifications.

1.14 CERTIFICATES:

On completion of the work, the Contractor shall obtain certificates of inspection, approval, acceptance and of compliance with all laws from all agencies and/or entities having jurisdiction over the work and shall deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The work shall not be deemed substantially complete until the certificates have been delivered. See General Comments regarding problems with specifying items required for substantial completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 35 03

No Text

SECTION 01 35 06
GENERAL ELECTRICAL REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section sets forth the General Requirements applicable to electrical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Project Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, shall take precedence.

B. This Section includes the following:

1. Procedure for Electrical Approval
2. Submittals
3. Electrical Installation Procedures
4. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
5. Electrical Wiring Devices
6. Electrical Conductors and Terminations
7. Circuit Protective Devices
8. Distribution Centers
9. Motors
10. Motor Control Equipment
11. Schedule of Electrical Equipment

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 33 00	SUBMITTAL PROCEDURES
C.	Section 01 35 03	GENERAL MECHANICAL REQUIREMENTS
D.	Section 01 42 00	REFERENCES
E.	Section 01 77 00	CLOSEOUT PROCEDURES
F.	Section 01 78 39	CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. WIRING: means both wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).

B. POWER WIRING: means wiring from a panel board or other specified source to a starter (if required) then to a disconnect (if required), then to the final point of usage such as a motor, unit or device.

C. CONTROL and/or INTERLOCK WIRING: means that wiring that signals the device to operate or shut down in response to a signal from a remote control device such as a temperature, smoke, pressure, float,

etc. device (starters and disconnect switches are not included in this definition) regardless of the voltage required for the controlling device.

D. RIGID STEEL CONDUIT: shall mean rigid steel, heavy wall conduit that is hot dipped galvanized inside and outside. The conduit shall meet the requirements of the latest edition, as amended, of the "Standard for Rigid Steel Conduit" of the Underwriters' Laboratories, Inc. Unless otherwise specified in the Specifications or indicated on the Contract Drawings, rigid steel conduit shall be used for all exposed work, for all underground conduits in contact with earth and for fire alarms systems, as required by the New York City Construction Codes.

E. ELECTRICAL METALLIC TUBING (EMT): shall mean industry standard thin wall conduit of galvanized steel only. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system shall be compatible for use with electric metallic tubing. Couplings and terminating fittings shall be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT shall meet the requirements of the latest edition, as amended, of the "Standard for Electrical Metallic Tubing of the Underwriters Laboratories Inc." EMT may only be used where specifically indicated. In no case will EMT be permitted in spaces other than hung ceilings and dry wall partitions.

F. FLEXIBLE METALLIC CONDUIT (FMC): Shall mean a conduit made through the coiling of a self-interlocking ribbed strip of aluminum or steel, forming a hollow tube through which wires can be pulled. For final connections to motors and motorized equipment, not more than a 4' - 0" length of flexible conduit may be used. For watertight installations, this conduit shall be of a watertight type, attached with watertight glands or fittings for final connections from outlet box to recessed lighting fixtures and in locations only where specifically permitted by the Specifications or Contract Drawings.

1.5 PROCEDURE FOR ELECTRICAL APPROVAL:

This Sub-Section sets forth General Electrical information, as well as required approvals for all electrical work required for the Project, including ancillary electrical work which may be included in the work of other trade subcontractors.

A. ELECTRIC SERVICE: The electric service supply is subject to commercial and operating variation of the utility company. Proper provision shall be made to have all apparatus operate normally under these conditions.

B. ACCEPTANCE: Acceptance and approval of the work will be contingent upon the inspection and test of the installation by the City regulatory agency.

C. TESTS: The Contractor shall notify the Commissioner when the Contractor has completed the work and is ready to have it inspected and tested. Upon completion of the work tests shall be made as required by the Commissioner of all electrical materials, electrical and associated mechanical equipment, and of appliances installed hereunder. The Contractor shall furnish all labor and material for such tests. Should the tests show that any of the material, appliances or workmanship is not first class or not in compliance with the Contract, the Contractor on written notice shall remove and promptly replace them with other materials in conformity with the Contract.

D. CERTIFICATE OF THE BUREAU OF ELECTRICAL CONTROL, OF THE DEPARTMENT OF BUILDINGS (B.E.C.): The Contractor must file prior to requesting a substantial completion inspection a Certificate of Inspection issued by B.E.C. On completion of the work the Contractor shall obtain certificates of inspection, approval, acceptance and compliance from all agencies and/or entities having jurisdiction over the work and shall deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES.

E. RESPONSIBILITY FOR CARE AND PROTECTION OF EQUIPMENT:

1. The Contractor furnishing any equipment shall be responsible for the equipment until it has been finally inspected, tested and accepted, in accordance with the requirements of the Contract.

2. After delivery and before and after installation, the Contractor shall protect all equipment against theft, injury or damage from all causes. The Contractor shall carefully store all equipment received for work, which is not immediately installed. If any equipment has been subject to possible injury by water, it shall be thoroughly dried out and put through a special dielectric test as directed by the Commissioner, at the expense of the Contractor or replaced by the Contractor without additional cost to the City.

F. UNIFORMITY OF EQUIPMENT: Any two (2) or more pieces of equipment, apparatus or materials of the same kind, type or classification which are intended to be used for identical types of service, shall be made by the same manufacturer.

1.6 SUBMITTALS:

A. CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL:

1. The Contractor shall submit to the Commissioner for approval, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, complete dimensional drawings of all equipment, wiring diagrams, motor test data, details of control, installation layouts showing all details and locations and including all schedules, and descriptions and supplementary data to comprise complete working drawings and instructions for the performance of the work. A description of the operation of the equipment and controls shall be included. A letter, in triplicate, shall accompany each submittal.

2. The Contractor shall submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, duplicate samples of such materials and appliances as may be requested by the Commissioner for approval. These samples shall be properly tagged for identification and submitted for examination and test. After the samples are approved, one (1) sample will be returned to the Contractor and the other sample will be filed in the office of the Commissioner's representative for inspection use. After the Contract is completed, the second set of samples will be returned to the Contractor.

B. TIMELINESS: All material shall be submitted in accordance with the submittal schedule in sufficient time for the progress of construction. Failure to promptly submit acceptable samples and dimensional drawings of equipment will not be accepted as grounds for an extension of time. The Commissioner may decline to consider submittals unless all related items are submitted at the same time.

C. CONTRACTOR'S STATEMENT WITH SUBMITTALS: Contractor shall submit statement in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

D. BULLETINS AND INSTRUCTIONS: The Contractor shall furnish and deliver to the Commissioner in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS and Section 01 77 00, CLOSEOUT PROCEDURES, after acceptance of the work, four (4) complete sets of instructions, technical bulletins and any other printed matter (diagrams, prints, or drawings) required to provide complete information for the proper operation, maintenance and repair of the equipment and the ordering of spare parts.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 ELECTRICAL INSTALLATION PROCEDURES:

This Sub-Section sets forth the General Installation Procedure that shall apply to all electrical work and electrical equipment appearing in the Contract.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INTENT OF CONTRACT DOCUMENTS: The Drawings and Specifications are to be interpreted as a means of conveying the scope and intent of the work without giving every minor electrical detail. It is intended, nevertheless, that the Contractor shall provide whatever labor and materials are found necessary, within the scope of the Contract, for the successful operation of the installation. Specific details of individual installations are to be finally decided upon when the Contractor submits Working or Shop Drawings for approval to DDC. Whenever there are two (2) or more methods to complete project work within the Contract scope, the Commissioner reserves the right to choose that method which, in the Commissioner's opinion, will afford the most satisfactory performance, lasting qualities, and accessibility for repairs, even though this selection is the most costly.

B. SCHEMATIC PLANS – APPROXIMATE LOCATIONS: Conduits and wiring are shown on the plans for diagrammatic purposes only. Therefore, conduit layouts may not necessarily give the actual physical route of the conduits. The Contractor who installs a conduit system will also be required, as part of the work, to furnish and install all hangers and pull-boxes, including any special pull-boxes found necessary to overcome interferences, and to facilitate the pulling of electrical cables. Similarly, the locations of equipment, appliances, outlets and other items shown on Contract Drawings are only approximate and are to be definitively established when equipment Shop Drawings are submitted and approved by DDC during construction.

C. SLEEVES: required for conduits passing through walls or floors, shall be furnished and set by the Contractor installing the conduits. Sleeves in waterproofed floors shall be provided with flashing extending 12 inches in all directions from sleeve and secured to waterproofing. Flashing shall be turned down into space between pipe and sleeve and caulked watertight. Flashing shall be 20 oz. cold rolled copper. Sleeves shall be supplied with welded flanges similar to those supplied by the subcontractor for Plumbing Work and shall extend one (1) inch above finished floor.

D. COORDINATION: The Contractor shall keep in close touch with the construction progress and obtain the necessary information for the accurate placement of its work in ample time before project construction operations obstruct its work. The Contractor is to consult all other Contract Drawings, as well as approved equipment Shop Drawings on file in the Resident Engineer's Field Office. This will aid in avoiding interferences, omissions and errors in the electrical installation.

E. RESTORATION: If drilling or cutting is done on finished surfaces of equipment or the structure, any marring of the surface shall be repaired or replaced by the Contractor. The Contractor shall be held responsible for corrective restoration due to its cutting or drilling, and for any damage to the project or its contents caused by the Contractor or the Contractor's workers. If any piercing of waterproofing occurs because of the installation of the work, the Contractor shall restore the waterproofing, at its own expense, to the satisfaction of the Commissioner.

F. ELECTRICAL WORK AT SITE: The Contractor furnishing equipment consisting of a number of related electrical devices or appliances, mounted in a single enclosure, or on a common base, shall furnish this unit complete with internal wiring, connections, terminal boxes with copper connectors and/or lugs and ample electrical leads, ready for connection and operation. The cost of any wiring, re-wiring or other work required to be done on this unit in the field, shall be borne by the Contractor, without additional cost to the City.

G. COOPERATION AMONG SUBCONTRACTORS: Whenever an electrically operated unit or system involves the combined work of several subcontractors for its installation and successful operation, the

Contractor shall require each subcontractor to exercise the utmost diligence in cooperating with others to produce a complete, harmonious installation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 ELECTRICAL CONDUIT SYSTEM INCLUDING BOXES (PULL, JUNCTION AND OUTLET):

This Sub-Section sets forth the requirements applying to the installation of electrical conduits, boxes or fittings. Rigid steel conduit shall be used throughout, unless otherwise directed by the Commissioner. Where the word 'conduit', without a modifier such as, rigid steel, EMT, etc., is specified to be used, it shall be interpreted to mean, rigid steel, heavy wall, threaded conduit.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INSTALLATIONS AND APPLICATIONS:

1. Unless otherwise specified or indicated on the Contract Drawings, conduit runs shall be installed concealed in finished spaces.
2. CONDUIT SIZES: The sizes of conduit shall be as indicated on the Contract Drawings. Wherever conduit sizes are not indicated, the conduit shall meet the requirements of the New York City Electrical Code to accommodate the conductors to be installed therein.
3. Conduits shall be reamed smooth after cutting. No running threads will be permitted. Universal type couplings shall be used where required. Conduit joints shall be screwed up to butt. Empty conduits after installation shall have all open ends temporarily plugged to prevent the entrance of water or other foreign matter.
4. Conduits being installed in concrete or masonry shall be securely held in place during pouring and construction operations. A group of conduits terminating together shall be held in place by a template.
5. UNDERGROUND STEEL CONDUITS: Unless otherwise specified, all underground steel conduits in contact with earth shall be encased by the Contractor who installs them, in a covering of not less than two (2) inches of an approved concrete mixture. Concrete mix shall be one (1) part cement to four and one-half (4 ½) parts of fine and coarse aggregate.
6. EXCAVATION RESTORATION PERMITS: When installing underground conduits, duct banks or manholes the Contractor shall perform the work of cutting pavement, excavation shoring, keeping trenches 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 insure that the device terminations are adequate for the wire or cable (whose size may be larger than expected due to voltage drop considerations) connected to the device.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 CIRCUIT PROTECTIVE DEVICES:

This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panel boards and Service Entrance.

A. CIRCUIT BREAKERS:

1. CIRCUIT BREAKERS: shall be operable in any position and shall be of the quick-make, quick-break type on manual operation. The handle shall be trip free, preventing contacts from being held in closed position against abnormal overloads or short circuits. Positive visual indication of automatic tripped position of breaker shall be provided, in addition to the "On" and "Off" indication. All circuit breakers shall be of the bolted type.

2. TRIP RATING: Circuit breakers shall be provided with the required number of trip elements, calibrated at 40 degrees C., ambient temperature, in accordance with wire sizes or motor currents as shown on Contract Drawings or indicated in the Specifications.

3. POLE BARRIER: Multipole pole breakers shall be designed to break all poles simultaneously. They shall be provided with barriers between poles and arc suppressing devices.

4. ELEMENTS: Multipole circuit breakers shall have frames of not less than a 100 Ampere rating. Multipole circuit breakers for 480 volts AC operation shall have an NEMA interrupting rating of 18,000 Amperes, unless a higher rating is specified in the Specific Requirements or indicated on the Contract Drawings.

5. For circuit breakers with frame size up to and including 225 Amperes, the breakers may be provided with non-interchangeable trip elements. For frame ratings above 225 Amperes, the breakers shall be provided with interchangeable trip elements, which can be replaced readily.

6. Single pole circuit breakers for branch circuits shall have a frame size of no less than 100 Amperes, and shall be rated at 125 volt A.C. with a NEMA interrupting rating of 10,000 Amperes, unless a higher rating is specified in the Specifications or indicated on the Contract Drawings.

7. INVERSE TIME ACTION: The circuit breakers shall be dual element type, one (1) element with time limit characteristics, so that tripping will be prevented on momentary overloads, but will occur before dangerous values are reached and the other with instantaneous trip action. Inverse time delay action shall be effective between a minimum tripping point of 125% of rating of breaker and an instantaneous tripping point between 600% and 700% of rated current.

8. CONSTANCY OF CALIBRATION: The tripping elements shall insure constant calibration and be capable of withstanding excessive short circuit conditions without injury.

9. CONTACTS: shall be non-welding under operating conditions and of the silver to silver type.

10. TEMPERATURE RISE: Current carrying parts, except thermal elements, shall not rise in temperature in excess of 30 degrees C. while carrying rated current at rated frequency.

11. NUMBERING: Each circuit breaker shall be distinctly numbered when installed in a group with other breakers. The calibration of trip element shall be indicated on each breaker.

B. SAFETY SWITCHES:

NEMA TYPE HD: When safety switches are permitted to be used for service entrance, motor disconnecting means or to control other types of electrical equipment, they shall be of the type HD of a rating not less than 30 Amperes. Enclosures shall be provided with means for locking. For ratings above 60 Amperes terminals shall have double studs.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.6

3.6 DISTRIBUTION CENTERS:

This Section sets forth the construction and installation procedure for Switchboards, Panel boards and Cabinets.

A. PANELBOARDS-GENERAL TYPE: The panel boards shall be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers shall be in accordance with the requirements outlined under "Circuit Protective Devices."

B. NUMBER AND RATING OF CIRCUIT BREAKERS: The Contract Drawings show a layout of each panel, giving the number, frame, size and trip setting of circuit breakers and number of branch circuits and spare breakers. Each branch circuit shall be distinctly numbered.

C. BUS-BAR CONSTRUCTION AND SUPPORT: Panel Boards shall be of the dead front type and shall have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers shall be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard shall be designed for the frame rating of the Service Breaker. Bus bars shall run up the center of the panel, unless otherwise indicated, and shall have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panel board shall be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers shall be used. A neutral bus of at least the same capacity as a live bus bar shall be provided for the connection of all neutral conductors. Each terminal shall be identified. All current carrying parts, exclusive of circuit breakers, shall be of copper with a minimum number of joints. The bus bar structure shall be a self-supporting unit, firmly fastened to a ½

inch plastic board, extending the full length and width of assembly which shall serve to insulate the bus structure from the back of panel box. Other methods affording equally effective bus structure support and insulation will be given consideration. An insulating barrier shall separate neutral bus from other parts of panel.

D. CIRCUIT BREAKER ASSEMBLY: The entire circuit breaker and bus bar assembly shall be mounted on an adjustable metal base or pan and secured to the back of panel box. The panel shall have edges flanged for rigidity.

E. PANEL MOUNTING: The panel shall be centered in the panel box to line up with door openings and set level and plumb so that no live parts are exposed with the door open.

F. PANEL CABINET:

1. PANEL CABINET INSTALLATION: When installed surface mounted in panel closets they shall be mounted on Kindorf channel.

2. Where cabinets cannot be set entirely flush due to shallow walls or partitions or where cabinet is extra deep, the protruding sides of cabinet shall be trimmed with a metal or hardwood return molding of approved design and fastened to cabinet so as to conceal the intersection between the wall and cabinet.

G. NAMEPLATES: Nameplates where required, shall be made of engraved Lamicoid 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

No Text

SECTION 01 35 26
SAFETY REQUIREMENTS PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements*". This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:

1. Definitions
2. Required Safety Meeting
3. Compliance with Regulations
4. Submittals
5. Personnel Protective Equipment
6. Hazardous Materials
7. Emergency Suspension of Work
8. Protection of Personnel
9. Environmental Protection

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 REQUIRED SAFETY MEETINGS:

A. Prior to commencing construction, the Resident Engineer will schedule and hold a preconstruction kick-off meeting either at DDC's main office or at the Project site with representatives of the Contractor, including the principal on-site project representative and one or more safety representatives, Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract Safety requirements. The Contractor's safety requirements shall be reviewed, and implementation of safety provisions pertinent to the Work shall be discussed.

B. The Contractor is responsible for conducting weekly documented jobsite safety meetings, given to all jobsite personnel including all subcontractors on the project, with the purpose of discussing safety topics and job specific requirements at the DDC worksite.

1.5 COMPLIANCE WITH REGULATIONS:

A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirement for CFR Parts 1910 and 1926, and 40 CFR, Parts 61, 261, 761 and 763.

B. Work involving disturbance or dismantling of asbestos or asbestos containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable.

C. Work shall additionally comply with all applicable federal, state and local safety and health regulations.

D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

E. All workers working on the DDC project site are required by NYC Local Law 41 to complete the OSHA 10 –hour training course.

1.6 SUBMITTALS:

A. The Contractor shall submit, to the Resident Engineer, copies of the Safety Program, Site Safety Plan and other required documentation in accordance with the *"New York City Department of Design and Construction Safety Requirements."*

B. Permits: If hazardous materials are disposed of off-site submit copies of shipping manifests and permits from applicable federal, state or local authorities and disposal facilities, and submit certificates that the material has been disposed of in accordance with regulations to the Resident Engineer.

C. Accident Reporting: Submit a copy of each accident report to the Resident Engineer in accordance with the *"New York City Department of Design and Construction Safety Requirements."*

D. All Asbestos and Lead project regulatory notifications are to be submitted to DDC's Bureau of Environmental and Geotechnical Services (BEGS) through the Resident Engineer.

E. Request for Subcontractor Approval: Any subcontractor performing environmental work shall submit required documentation for approval to perform such work as required by DDC's BEGS.

PART II – PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT:

Special facilities, devices, equipment and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E and other applicable regulations.

2.2 HAZARDOUS MATERIALS:

A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous.

B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.

C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

PART III – EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK:

A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.

B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.

C. When, in the opinion of the Commissioner, the Contractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that work may resume.

D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

3.2 PROTECTION OF PERSONNEL:

A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a subcontractor.

B. Whenever practical, the work area shall be fenced, barricaded or otherwise blocked off from the Public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00, TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including, without limitation, the following:

1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
2. Corridors, aisles, stairways, doors and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition or other hazardous activity.
4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers, and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

3.3 ENVIRONMENTAL PROTECTION:

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state and local noise control laws, ordinances and regulations, including but not limited to 29 CFR 1910.95, 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

END OF SECTION 01 35 26

No Text

SECTION 01 35 91
HISTORIC TREATMENT PROCEDURES

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for the treatment of Landmark Structures and Landmark Quality Structures, as identified in the Addendum. Specific requirements are indicated in other sections of the Specifications.

B. This Section includes, without limitation, the following:

1. Storage and protection of existing historic materials
2. Temporary protection of historic materials during construction
3. General Protection
4. Protection during use of heat-generating equipment
5. Photographic Documentation
6. NYC Landmarks Preservation Commission Final Approval signoffs

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 77 00 CLOSEOUT PROCEDURES
E. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Landmark Structure or Site: Any building or site which has been designated as a landmark, or any building or site within a landmark district, as designated by the New York City Preservation Commission or the New York State Historic Preservation Office.

D. Landmark Quality Structure: Any building which has been determined by the City to be of landmark quality and/or historical significance.

E. Preservation: To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

F. Rehabilitation: To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

G. Restoration: To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.

H. Reconstruction: To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

I. Stabilize: To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.

J. Protect and Maintain: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

K. Repair: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

L. Replace: To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:
   1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
   2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
   3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

M. Remove: To detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

N. Remove and Salvage: To detach items from existing construction and deliver them to the City ready for reuse.

O. Remove and Reinstall: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

P. Existing to Remain or Retain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

Q. Material in Kind: Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.

1.5 SUBMITTALS:

A. Historic Treatment Program: Submit a written plan for each phase or process, including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, submit for Commissioner's approval a written description including evidence of successful use on other comparable projects, and program of testing to demonstrate effectiveness for use on this Project.

C. Qualification Data: For historic treatment specialists as specified and required by individual sections of the project specifications.

D. Photographs for Designated Landmark Structures: Submit photographs in accordance with Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION and as described in this section.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.6 QUALITY ASSURANCE:

A. Special Experience Requirements: Special Experience Requirements may apply to the firm that will provide Historic Treatment Services. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.

B. Historic Treatment Preconstruction Conference: The Resident Engineer will schedule and hold a preconstruction meeting at the site in accordance with Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION.

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

a. Record procedures established as a result of the review and distribute to affected parties.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS:

A. Removed and Salvaged Historic Materials: As specified and required by individual sections of the project specifications.

B. Removed and Reinstalled Historic Materials: As specified and required by individual sections of the project specifications.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by the Commissioner, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials, at a location acceptable to the Commissioner, within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 PROTECTION, GENERAL:

A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
2. Attachments of temporary protection to existing construction shall be approved by the Commissioner prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.
2. Bind spreading shrubs.
3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work of this Section until the drains are in working order.

1. Provide a method to prevent solids, including stone or mortar residue, from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of work performed under this Contract.
2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT:

A. No roofing work requiring the use of an open flame shall be permitted on any Landmark Structure or any Landmark Quality Structure, whose roof or wall structure is made of wood or primarily of wood.

B. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Commissioner's approval for operations involving use of open-flame or welding equipment. Notification shall be given for each occurrence and location of work with heat-generating equipment.
2. As far as practical, use heat-generating equipment in shop areas or outside the building.
3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.

4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.

5. Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.

6. If combustible material cannot be removed, provide fireproof blankets to cover such materials.

7. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.

8. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

9. Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

C. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.3 PHOTOGRAPHIC DOCUMENTATION:

Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:

For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the work, shall submit to the Commissioner, in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS, all documentation concerning the successful execution of all historic treatments. This shall include, but not be limited to, copies of all before and after photographs of historic treatments, one copy of the Contractor's as-built drawings, copies of testing and analysis results, including cleaning, mortar analysis, pointing mortars and all other information pertaining to work performed under the New York City Landmarks Preservation Commission jurisdiction.

END OF SECTION 01 35 91

No Text

SECTION 01 40 00
QUALITY REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:
   a. Definitions
   b. Conflicting Requirements
   c. Quality Assurance
   d. Quality Control
   e. Approval of Materials
   f. Special Inspections (Controlled Inspection)
   g. Inspections by Other City Agencies
   h. Certificates of Approval
   i. Acceptance Tests
   j. Repair and Protection

B. This Section includes administrative and procedural requirements for quality control to assure compliance with quality requirements specified in the Contract Documents.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

D. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

E. Provisions of this Section do not limit requirements for the Contractor to provide quality-assurance and -control services required by the Commissioner or authorities having jurisdiction.

F. Specific test and inspection requirements are specified in the individual sections of the Specifications.

G. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."

H. COMMISSIONING: Refer to the Addendum to identify whether this project will be Commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
C.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
D.	Section 01 33 00	SUBMITTAL PROCEDURES
E.	Section 01 77 00	CLOSEOUT PROCEDURES
F.	Section 01 78 39	CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Commissioning: A Total Quality Assurance process that includes checking the design and installation of equipment, as well as performing functional testing of the same to confirm that the installed equipment is operating and in conformance with the Contract Documents and the City's requirements.

1.5 CONFLICTING REQUIREMENTS:

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, the Contractor shall comply with the most stringent requirement as determined by the Commissioner. The Contractor shall refer any uncertainties and/or conflicting requirements to the Commissioner for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. The Contractor shall refer any uncertainties to the Commissioner for a decision before proceeding.

1.6 QUALITY ASSURANCE:

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections specify additional requirements.

B. Installer Qualifications: Special Experience Requirements may apply to the firm that will install, erect or assemble specified work required for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.

C. Manufacturer Qualifications: Special Experience Requirements may apply to the firm that will manufacture equipment, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.

D. Fabricator Qualifications: Special Experience Requirements may apply to the firm that will fabricate material, products or systems specified for the Project. If applicable, such Special Experience Requirements are set forth in the Bid Booklet and the Addendum.

E. Professional Engineer Qualifications: A professional engineer who is licensed to practice in the State of New York and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by the Resident Engineer.
2. Notify Resident Engineer seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Design Consultant's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise directed or indicated.

1.7 QUALITY CONTROL:

A. City's Responsibilities: Where quality-control services are indicated as the City's responsibility in the Specifications, the City will engage a qualified testing agency to perform these services.

1. COST OF TESTS BORNE BY THE CITY: Where the City directs tests to be performed to determine compliance with the Specifications regarding materials or equipment, and where such compliance is ascertained as a result thereof, the City will bear the cost of such tests.
2. The City will furnish the Contractor with names, addresses, and telephone numbers of testing entities engaged and a description of the types of testing and inspecting they are engaged to perform.
3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor.

B. Contractor's Responsibility: Tests and inspections not explicitly assigned to the City are the Contractor's responsibility. Unless otherwise indicated, the Contractor shall provide quality-control services as set forth in the Specifications and those required by Authorities having jurisdiction. The Contractor shall provide quality-control services required by Authorities having jurisdiction, whether specified or not.

1. COST OF TESTS BORNE BY CONTRACTOR – In the case of tests which are specifically called for in the Specifications to be provided by the Contractor or tests which are required by any Authority having jurisdiction, but are not indicated as the responsibility of the City, the cost thereof shall be borne by the Contractor and shall be deemed to be included in the Contract price. The Contractor shall reimburse the City for expenditures incurred in providing tests on materials and equipment submitted by the Contractor as the equivalent of that specifically named in the Specifications and rejected for non-compliance.
2. Where services are indicated as Contractor's responsibility, the Contractor shall engage a qualified testing agency to perform these quality-control services. Any testing agency engaged by the Contractor to perform quality control services is subject to prior approval by the Commissioner.

3. The Contractor shall not employ same entity engaged by the City, unless agreed to in writing by the Commissioner.
4. The Contractor shall notify testing agencies and the Resident Engineer at least 72 hours in advance of the date and time for the performance of Work that requires testing or inspecting.
5. Where quality-control services are indicated as Contractor's responsibility, the Contractor shall submit a certified written report, in triplicate to the Commissioner, of each quality-control service.
6. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
7. The Contractor shall submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, the Contractor shall engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Results shall be submitted in writing as specified in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Retesting/Re-inspecting: Regardless of whether the original tests or inspections were the Contractor's responsibility, the Contractor shall provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Associated Services: The Contractor shall cooperate with entities performing required tests, inspections, and similar quality-control services, and shall provide reasonable auxiliary services as requested. The Contractor shall notify the testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist testing entity in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing entities.
6. Design mix proposed for use for material mixes that require control by the testing entity.
7. Security and protection for samples and for testing and inspecting equipment at the Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

2. Coordinate and cooperate with the Commissioning Authority/Agent as applicable for start-up, inspection and functional testing in the implementation of the Commissioning Plan.

G. Manufacturer's Directions: Where the Specifications provide that the manufacturer's directions are to be used, such printed directions shall be submitted to the Commissioner.

H. Inspection of Material: In the event that the Specifications require the Contractor to engage the services of an entity to witness and inspect any material especially manufactured or prepared for use in or part of the permanent construction, such entity shall be subject to prior written approval by the Commissioner.

1. NOTICE - The Contractor shall give notice in writing to the Commissioner sufficiently in advance of its intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Commissioner will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials, or the Commissioner will notify the Contractor that the inspection will be made at a point

other than the point of manufacture, or the Commissioner will notify the Contractor that inspection will be waived.

I. No Shipping Before Inspection: The Contractor shall comply with the foregoing before shipping any material.

J. Certificate of Manufacture: When the Commissioner so requires, the Contractor shall furnish to the Commissioner authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Specifications. These certificates shall include copies of the results of physical tests and chemical analyses where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. This may include such approvals as B.S.A., M.E.A., B.E.C. Advisory Board, etc.

K. Acceptance: When materials or manufactured products shall comprise such quantity that it is not practical to make physical tests or chemical analyses directly on the product furnished, a certificate stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Commissioner, be considered as the basis for the acceptance of such material or manufactured product.

L. Testing Compliance: The testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Specifications, indicating thereon all analyses and/or test data and interpreted results thereof.

M. Reports: Six (6) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.

N. Rejections: If, in making any test, it is ascertained by the Commissioner that the material or equipment does not comply with the Specifications, the Contractor will be notified thereof, and will be directed to refrain from delivering said materials or equipment, or to promptly remove it from the site or from the work and replace it with acceptable material at no additional cost to the City.

O. Furnish Designated Materials: Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor shall immediately proceed to furnish the designated material or equipment.

1.8 APPROVAL OF MATERIALS:

A. Local Laws: All materials, appliances and types or methods of construction shall be in accordance with the Specifications and shall in no event be less than that necessary to conform to the requirements of the New York City Construction Codes, Administrative Code and Charter of the City of New York.

B. Approval of Manufacturer: The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Commissioner for approval, as early as possible, to afford proper review and analysis. No manufacturer will be approved for any materials to be furnished under the Contract unless it shall have a plant of ample capacity and shall have successfully produced similar products. All approvals of materials or equipment that are legally required by the New York City Construction Codes and other governing Authorities must be obtained prior to installation.

C. All Materials: Fixtures, fittings, supplies and equipment furnished under the Contract shall be new and unused, except as approved by the Commissioner, and of standard first-grade quality and of the best workmanship and design. The City of New York encourages the use of recycled products where practical.

D. INFORMATION TO SUPPLIERS - In asking for prices on materials under any item of the Contract, the Contractor shall provide the manufacturer or dealer with such complete information from the

Specifications and Contract Drawings as may in any case be necessary, and in every case the Contractor shall inform the manufacturer or dealer of all the General Conditions and requirements herein contained.

1.9 SPECIAL INSPECTIONS:

A. SPECIAL INSPECTIONS:

1. Inspection of selected materials, equipment, installation, fabrication, erection or placement of components and connections made during the progress of the Work to ensure compliance with the Contract Documents and provisions of the New York City Construction Codes, shall be made by a Special Inspector. The City of New York will retain the services of the Special Inspector and bear the costs for the performance of Special Inspections in compliance with NYC Construction Codes requirements or as additionally may be called for in the project specifications, except as noted below for Form TR-3: Technical Report for Concrete Design Mix. The Special Inspector shall be an entity compliant with the requirements of the New York City Construction Codes. The Contractor shall notify the relevant Special Inspector in writing at least 72 hours before the commencement of any work requiring special inspection.
2. Form TR3: Technical Report Concrete Design Mix: The contractor shall be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.
3. The Contractor shall notify the relevant Special Inspector in writing at least 72 hours before the commencement of any work requiring Special Inspection. The contractor shall be responsible for, and bear related costs to assure that all construction or work shall remain accessible and exposed for inspection purposes until the required inspection is completed.
4. Inspections and tests performed under "Special Inspection" shall not relieve the Contractor of the responsibility to comply with the Contract Documents, and that there is no warranty given to the Contractor by the City of New York in connection with such inspection and tests or certifications made under "Special Inspections".
5. The contractor must coordinate with the Resident Engineer or DDC Project Manager to provide access and schedule the work for inspection by the Special Inspector.

1.10 INSPECTIONS BY OTHER CITY AGENCIES:

A. Letter of Completion: Just prior to substantial completion of this Project, the Commissioner will file with the Department of Buildings, an application for a Letter of Completion or a Certificate of Occupancy for the structure.

B. Final Inspections: In connection with the above mentioned application for a Letter of Completion or a Certificate of Occupancy and before certificates of final payments are issued, the Contractor will be required to arrange for all final inspections by the inspection staff of the Department of Buildings, Fire Department or other Governmental Agencies having jurisdiction, and secure all reports, sign offs, certificates, etc., by such inspection staff or other governmental agencies, in order that a Letter of Completion or Certificate of Occupancy can be issued promptly.

1.11 CERTIFICATES OF APPROVAL:

A. Responsibility: The Contractor shall be responsible for and shall obtain all final approvals for the work installed under the Contract in the form of such certificates that are required by all governmental agencies having jurisdiction over the work of the Contract.

B. Transmittal: All such certificates shall be forwarded to the Commissioner through the Resident Engineer.

1.12 ACCEPTANCE TESTS:

A. Government Agencies: All equipment and appliances furnished and installed under the Contract shall conform to the requirements of the Specifications, and shall in no event be less than that necessary to comply with the minimum requirements of the law and all of the governmental agencies having jurisdiction.

B. Notice of Tests: Whenever the Specifications and/or any governmental agency having jurisdiction requires the acceptance test, the Contractor shall give written notice to all concerned of the time when these tests will be conducted.

C. Energy: The City will furnish all energy, fuel, water and light required for tests.

D. Labor and Materials: The Contractor shall furnish labor and all other material and instruments necessary to conduct the acceptance tests at no additional cost to the City.

E. Certificates: The final acceptance by the Commissioner shall be contingent upon the Contractor delivering to the Commissioner all necessary certificates evidencing compliance in every respect with the requirements of the regulatory agencies having jurisdiction.

F. Results: If the results of tests and Special Inspections indicate that the material or procedures do not meet requirements as set forth on the Contract Drawings or in the Specifications or are otherwise unsatisfactory, the Contractor shall only proceed as directed by the Resident Engineer. Additional costs resulting from retesting, re-inspecting, replacing of material and/or damage to the work and any delay caused to the schedule shall be borne by the Contractor.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

END OF SECTION 01 40 00

No Text

SECTION 01 42 00
REFERENCES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 DEFINITIONS:

REFER TO THE ADDENDUM, Article IX, FOR ADDITIONAL DEFINITIONS AND REVISIONS TO THE CONTRACT AND SPECIFICATIONS

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. "APPROVED," ETC. - "Approved," "acceptable," "satisfactory," and words of similar import shall mean and intend approved, acceptable or satisfactory to the Commissioner.

C. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

D. "DIRECTED," "REQUIRED," ETC.- Wherever reference is made in the Contract to the work or its performance, the terms "directed," "required," "permitted," "ordered," "designated," "prescribed," "determined," and words of similar import shall, unless expressed otherwise, imply the direction, requirements, permission, order, designation or prescription of the Commissioner.

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings.

1.3 CODES, AGENCIES AND REGULATIONS:

A.D.A.A.G.	Americans with Disabilities Act (ADA) – Architectural Barriers Act (ABA)
B.G. & E.	Bureau of Gas and Electricity of the City of New York
B.S. & A.	New York City Board of Standards and Appeals
DOE	Department of Energy
E.C.C.C.N.Y.S.	Energy Conservation Construction Code of New York State
EPA	Environmental Protection Administration
N.Y.C.C.C.	New York City Construction Codes – includes:
	New York City Plumbing Code
	New York City Building Code
	New York City Mechanical Code
	New York City Fuel Gas Code
N.Y.S.D.O.L	New York State Department of Labor
N.Y.C.D.E.P	New York City Department of Environmental Protection
N.Y.C.E.C.	New York City Electrical Code
N.Y.C.E.C.C	New York City Energy Conservation Code
N.Y.C.F.C	New York City Fire Code
N.Y.S...D.E.C.	New York State Department of Environmental Conservation
O.S.H.A.	Occupational Safety & Health Administration

1.4 INDUSTRY STANDARDS:

A. STANDARD REFERENCES – Unless otherwise specifically indicated in the Contract Documents, whenever reference is made to the furnishing of materials or testing thereof that conforms to the standards of any technical society, organization or body, it shall be construed to mean the latest standard, code, specification adopted and published by that technical society, organization or body, as of the date of the bid opening, Unless the provisions of the New York City Construction Codes adopts a different or earlier dated version of such standard.

B. APPLICABILITY OF STANDARDS: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect, to the extent referenced, as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.

C. CONFLICTING REQUIREMENTS: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantity or quality, comply with the most stringent requirements. Immediately refer uncertainties, and requirements that are different but apparently equal, to the Commissioner in writing for a decision before proceeding.

D. STANDARD SPECIFICATIONS - When no reference is made to a code, standard or specification, the Standard Specifications of the ASTM or the AIEE, as the case may be, shall govern.

E. REFERENCES - Reference to a technical society, organization or body may be made in the Specifications by abbreviations. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the associated name. The following names are subject to change and are

believed, but are not assured, to be accurate and up-to-date as of the Issue Date of the Contract Documents.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists (The)
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	ACI International (American Concrete Institute)
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AGMA	American Gear Manufacturer Association
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)

ALSc	American Lumber Standard Committee, Incorporated
ALI	Automotive Lift Institute
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE/SEI	American Society of Civil Engineers, Structural Engineering Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	AWCI International (Association of the Wall and Ceiling Industry International)
AWCMA	American Window Covering Manufacturers Association (Now WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWSC	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)

BICSI	BICSI
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
CIBSE	Charted Institute of Building Services Engineers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CGSB	Canadian General Standards Board
CIMA	Cellulose Insulation Manufacturers Association
CIPRA	Cast Iron Pipe Research Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CPSC	Consumer Product Safety Commission
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)

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
FEME	Federal Emergency Management Agency
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FMG	FM Global (Formerly: FM - Factory Mutual System)
FMRC	Factory Mutual Research (Now FMG)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Now GSI)
GS	Green Seal
GSI	Geosynthetic Institute

HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
HUD	U.S. Department of Housing and Urban Development
IAPMO	International Association of Plumbing and Mechanical Officials
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation
ICC	International Code Council, Inc.
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
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
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)
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
SCS	Scientific Certification System
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SGCC	Safety Glazing Certification Council
SHBI	Steel Heating Boiler Institute
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society

TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute)
UL	Underwriters Laboratories Inc.
ULC	Underwriters Laboratories of Canada
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USC	United States Code
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association (Now WCSC)
WCSC	Window Covering Safety **Council** (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WRI	Wire Reinforcement Institute, Inc.
USEPA	United States Environmental Protection Agency
WSRCA	Western States Roofing Contractors Association
WWPA	Western Wood Products Association

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 42 00

No Text

SECTION 01 50 00
TEMPORARY FACILITIES, SERVICES AND CONTROLS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
   a. Temporary Water System
   b. Temporary Sanitary Facilities
   c. Temporary Electric Power, Temporary Lighting System, And Site Security Lighting
   d. Temporary Heat
   e. Dewatering Facilities And Drains
   f. Temporary Field Office for Contractor
   g. Resident Engineer's Office
   h. Material Sheds
   i. Temporary Enclosures
   j. Temporary Partitions
   k. Temporary Fire Protection
   l. Work Fence Enclosure
   m. Rodent and Insect Control
   n. Plant Pest Control Requirements
   o. Project Identification Signage
   p. Security Guards/Fire Guards on Site
   q. Project Sign and Rendering
   r. Safety

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 42 00 REFERENCES
C. Section 01 54 11 TEMPORARY ELEVATORS AND HOISTS
D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING
E. Section 01 77 00 CLOSE OUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Permanent Enclosure: As determined by Commissioner, permanent or temporary roofing that is complete, insulated, and weather tight; exterior walls which are insulated and weather tight; and all openings that are closed with permanent construction or substantial temporary closures.

C. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Reports: Submit reports of tests, inspections, meter readings and similar procedures for temporary use.

1.6 PROJECT CONDITIONS:

A. Temporary Use of Permanent Facilities and Services: The Contractor shall be responsible for the operation, maintenance, and protection of each permanent facility and service during its use as a construction facility before Final Acceptance by the City, regardless of previously assigned responsibilities.

B. Install, operate, maintain and protect temporary facilities, services and controls.
1. Keep temporary services and facilities clean and neat in appearance.
2. Operate temporary services in a safe and efficient manner.
3. Relocate temporary services and facilities as needed as Work progresses.
4. Do not overload temporary services and facilities or permit them to interfere with progress.
5. Provide necessary fire prevention measures.
6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-site.

1.7 NON-REGULAR WORK HOURS (OVERTIME):

A. The Contractor shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if the Drawings and/or the Specifications indicate that the Work, or specific components thereof, must be performed during other than regular working hours. In such case, all costs for the provision of temporary services, facilities and controls during other than regular working hours shall be deemed included in the total Contract Price.

B. The Contractor shall provide the temporary services, facilities and controls set forth in this Section during other than regular working hours if a change order is issued directing the Contractor to perform the Work, or specific components thereof, during other than regular working hours. In such case, compensation for the provision of temporary services, facilities and controls during other than regular working hours shall be provided through the change order.

1.8 SERVICES BEYOND COMPLETION DATE:

A. The Contractor shall provide the temporary services, facilities and controls set forth in this Section until the date on which it completes all required work at the site, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor shall provide such temporary services, facilities and controls even if completion of all required work at the site occurs after the time fixed for such completion in Schedule A.

PART II – PRODUCTS

2.1 MATERIALS:

A. Provide undamaged materials in serviceable condition and suitable for use intended.
B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
C. Water: Potable and in compliance with requirements of the Department of Environmental Protection.

2.2 EQUIPMENT:

A. Provide undamaged equipment in serviceable condition and suitable for use intended.
B. Water Hoses: Heavy-duty abrasive-resistant flexible rubber hoses, 100 feet (30 m) long with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
C. Electric Power Cords: Grounded extension cords.
   1. Provide hard-service cords where exposed to abrasion or traffic.
   2. Provide waterproof connectors to connect separate lengths of electric cords where single lengths will not reach areas of construction activity.
   3. Do not exceed safe length-voltage ratio.
D. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART III –EXECUTION:

3.1 INSTALLATION, GENERAL:

A. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities as approved by the Resident Engineer.

3.2 TEMPORARY WATER SYSTEM:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 A

A. TEMPORARY WATER SYSTEM - NEW FACILITIES: During construction, the Contractor shall furnish a Temporary Water System as set forth below.
   1. Immediately after the Commissioner has issued an order to start work, the Contractor shall file an application with the Dept. of Environmental Protection for the schedule of charges for water use during construction. The Contractor will be responsible for payment of water charges.
   2. Immediately after the Commissioner has issued an order to start work, the Contractor shall file an application with the Department of Environmental Protection's Bureau of Water Supply and obtain a permit to install the temporary water supply system. The system shall be installed and maintained for the use of the Contractor and its subcontractors. A copy of the above mentioned permit shall be filed with the Commissioner. The Contractor shall provide temporary water main, risers and waste stacks as directed and install on each floor, outlets with two (2) 3/4" hose valve connections over a barrel installed on a steel pan. The Contractor shall provide drains from the pans to the stack and house sewer and hose bibs to drain the water supply

risers and mains. During winter months, the Contractor shall take the necessary precautions to prevent the temporary water system from freezing. The Contractor shall provide repairs to the temporary water supply system for the duration of the project until said temporary system is dismantled and removed.

3. Disposition of Temporary Water System: The Contractor shall be responsible for dismantling the temporary water system when no longer required for the construction operations, or when replaced by the permanent water system installed for the project, or as otherwise directed by the Resident Engineer. All repair work resulting from the dismantling of the temporary water system shall be the responsibility of the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 B

B. TEMPORARY WATER SYSTEM – PROJECTS IN EXISTING FACILITIES:
   1. When approved by the Commissioner, use of existing water system will be permitted for temporary water service during construction, as long as the system is cleaned and maintained in a condition acceptable to the Commissioner. At Substantial Completion, the Contractor shall restore the existing water system to conditions existing before initial use.
   2. The Contractor shall be responsible for all repairs to the existing water system permitted to be used for temporary water service during construction. The Contractor shall be responsible to maintain the existing system in a clean condition on a daily basis, acceptable to the Commissioner.
   3. The Contractor will be responsible for payment of water charges as directed by the Commissioner. Billing will be in accordance with the Department of Environmental Protection schedule of charges for Building Purposes.

C. WASH FACILITIES: The Contractor shall install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition.
   1. Dispose of drainage properly.
   2. Supply cleaning compounds appropriate for each condition.
   3. Include safety showers, eyewash fountains and similar facilities for the convenience, safety and sanitation of personnel.

D. DRINKING WATER FACILITIES: The Contractor shall provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg. F (7 to 13 deg. C).

3.3 TEMPORARY SANITARY FACILITIES:

A. The Contractor shall provide toilets, wash facilities and drinking water fixtures in compliance with regulations and health codes for type, number, location, operation and maintenance of fixtures and facilities. Provide toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility, and provide covered waste containers for used materials.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 B

B. SELF-CONTAINED TOILET UNITS:
   1. The Contractor shall provide temporary single-occupant toilet units of the chemical, aerated re-circulation, 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 Contractors 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 15th to April 15th.

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 devises or equipment SHALL NOT BE ALLOWED for use as temporary heat other than construction-related curing or drying in conformance with the NYC Fire Code.

3. No open fires will be permitted.

F. TEMPORARY HEATING SYSTEM:

1. The temporary system for the provision of Temporary Heat provided by the Contractor following enclosure of the building shall be complete including, subject to provisions of paragraph E above, boilers pumps, radiators, space heaters, water and heating piping, insulation and controls. The temporary system for the provision of Temporary Heat shall be capable of maintaining the minimum temperature requirements set forth in Paragraph C above.

G. COORDINATION:

1. The Contractor, in the provision of Temporary Heat, shall coordinate its operations in order to insure sufficient and timely performance of all required work, including work performed by trade subcontractors. The Contractor shall supply and pay for all water required and used in the building for the operation of the heating system(s) for the purpose of Temporary Heat. The Contractor shall include all expenses in connection with the supply of water for Temporary Heat in its Total Contract Price. During the period in which Temporary Heat in an enclosed building is being furnished and maintained, the Contractor shall provide proper ventilating and drying, open and close the windows and other openings when necessary for the proper execution of the work and also when directed by DDC. The Contractor shall maintain all permanent or temporary enclosures at its own expense.

H. USE OF PERMANENT HEATING SYSTEMS:

1. Use of Permanent Heating System for Temporary Heat after Building Enclosure
   a. The Contractor shall provide all labor and materials to promptly furnish and set all required equipment and convectors and/or radiators, piping, valves, fitting, etc., in ample time for their use for the provision of Temporary Heat after enclosure of the building.
   b. New portions of the permanent heating system that are used for furnishing Temporary Heat shall be left in near perfect condition when delivered to the City for operation. Any repairs required, other than for ordinary wear and tear on the equipment, shall be made by the Contractor at his/her expense. The starting date for the warranty or guarantee period for such equipment shall be the date of Substantial Completion acceptance.
   c. In the event that the Contractor does not advance the installation of the permanent heating system in sufficient time to permit its use for Temporary Heat as determined by DDC, the Contractor shall furnish and install a separate system for the provision of Temporary Heat as required to maintain the minimum temperature requirements set forth in Paragraph C above.
2. All equipment for the system for the provision of Temporary Heat shall be placed so as to comply with the requirements specified hereinbefore, and shall be connected, disconnected and suitably supported and located so as to permit construction work, including finish work such as wall plastering and painting, to proceed. The installation of the system for the provision of Temporary Heat by the Contractor, including the placing of ancillary system equipment, shall be coordinated with the operations of all trade subcontractors so as to insure sufficient and timely performance of the work. Once the permanent heating system is operating properly, the Contractor shall remove all portions of the system for Temporary Heat not part of the permanent heating system.

3. Temporary Heat Allowance for Special Conditions or and/or Unforeseen Circumstances.
   a. The City may establish an allowance in the Contract for payment of costs and expenses in connection with the provision of Temporary Heat as set forth herein. If established, the City will include an amount for such allowance on the Bid Form, and the Contractor shall

include such allowance amount in its Total Contract Price. The Contractor shall only be entitled to payment from this allowance under the conditions and in accordance with the requirements set forth below. In the event this allowance or any portion thereof remains unexpended at the conclusion of the Contract, such allowance shall remain the sole property of the City. Should the amount of the allowance be insufficient to provide payment for the expenses specified below, the City will increase the amount of the allowance.

b. The allowance set forth herein may be utilized only under the conditions set forth below.
   1. In the event the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification and/or shut down of the existing permanent heating system, or any key component thereof, and the Commissioner determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor shall be responsible for the provision of Temporary Heat, as directed by the Commissioner. The City shall pay such Contractor for all costs for labor, material, and equipment necessary and required for the same. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall be as set forth in Paragraph (c) below.
   2. In the event the Commissioner determines that there is a need for maintenance of the permanent heating system by the Contractor after written acceptance by the Commissioner of the work, and that the need for such maintenance is not the fault of the Contractor, the Contractor shall provide the required maintenance of the permanent heating system for the period of time directed by the Commissioner. The City shall pay the Contractor for the cost of direct labor and fuel necessary and required in connection with such maintenance, excluding the cost of any foremen or other supervision. Payment shall be made in accordance with Article 26 of the Contract, except that the cost of fuel shall be as set forth in Paragraph (c) below.

c. Payment for Fuel Costs - Payment from the allowance set forth herein for the cost of fuel necessary and required to operate the system for the provision of Temporary Heat or to maintain the permanent heating system under the conditions set forth in Paragraph b above shall be limited to the direct cost of such fuel. The Contractor shall not be entitled to any overhead and/or profit for such fuel costs. In order to receive payment for such fuel costs, the Contractor must present original invoices for the same. DDC reserves the right to furnish the required fuel.

I. RELATED ELECTRICAL WORK:

1. The Contractor shall be responsible for providing the items set forth below and shall include all expenses in connection with such items in its Total Contract Price. The Contractor shall provide such items promptly when required and shall in all respects coordinate its work with the work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.
   a. The Contractor shall provide all labor, materials, equipment and power necessary and required to furnish and maintain any temporary or permanent electrical connections to all equipment specified to be connected as part of the work of his Contract.
   b. The Contractor shall supply and pay for all power necessary and required for the operation of the system for the provision of Temporary Heat and/or the permanent heating system used for Temporary Heat. Such power shall be provided by the Contractor for the duration the Contractor is required to provide Temporary Heat, as set forth in Sub-section 3.5 D herein.
2. In providing the items set forth in Paragraph 1 above, the Contractor is advised that labor may be required seven (7) days a week and/or during other than normal working hours for the period of time required by seasonal weather conditions.

J. RELATED PLUMBING WORK:
1. The Contractor shall be responsible for providing all labor, materials and equipment necessary and required to furnish and maintain all temporary or permanent connections to all equipment or plumbing outlets specified to be provided as part of the work of this Contract. The Contractor shall include all expenses in connection with such items of work in its Total Contract Price. The Contractor shall provide such items of work promptly when required and shall in all respects coordinate its work with the work performed by trade subcontractors in order to facilitate the provision of Temporary Heat.
2. In the event portions of the permanent plumbing equipment furnished by the Contractor as part of the work of this Contract are used for the provision of Temporary Heat either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor shall be responsible to provide such plumbing equipment to the City in near perfect condition and shall make any repairs required, other than for ordinary wear and tear on the equipment, at his expense. The starting date for warranty and/or guarantee period for such plumbing equipment shall be the date of Substantial Completion acceptance by the City.
3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor shall promptly perform all required filings and coordination with the Utility Companies in order to expedite the installation, testing, and approval of the gas service and associated meter(s).

3.6 STORM WATER CONTROL, DEWATERING FACILITIES AND DRAINS:

A. PUMPING:
1. Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rainfall.
2. Contractor shall furnish and install all necessary automatically operated pumps of adequate capacity with all required piping to run-off agencies, so as to maintain the excavation, cellar floor, pits and exterior depressions and excavations free from accumulated water during the entire period of construction and up to the date of final acceptance of work of the Contract.
3. All pumps shall be maintained at all times in proper working order.
4. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
5. Remove snow and ice as required to minimize accumulations.

3.7 TEMPORARY FIELD OFFICE FOR CONTRACTOR:

A. The Contractor shall establish a temporary field office for its own use at the site during the period of construction, at which readily accessible copies of all Contract Documents shall be kept.
B. The field office shall be located where it will not interfere with the progress of any part of the work or with visibility of traffic control devices.
C. CONTRACTOR'S REPRESENTATIVE: In charge of the office there shall be a responsible and competent representative of the Contractor, duly authorized to receive orders and directions and to put them into effect.
D. Arrangements shall be made by the Contractor whereby its representative may be readily accessible by telephone.
E. All temporary structures shall be of substantial construction and neat appearance, and shall be painted a uniform gray unless otherwise directed by the Commissioner.
F. CONTRACTOR'S SIGN - The Contractor shall post and keep posted, on the outside of its field office, office or exterior fence or wall at site of work, a legible sign giving full name of the company, address of the company and telephone number(s) of responsible representative(s) of the firm who can be reached in event of an emergency at any time.

G. ADVERTISING PRIVILEGES - The City reserves the right to all advertising privileges. The Contractor shall not cause any signs of any kind to be displayed at the site unless specifically required herein or authorized by the Commissioner.

3.8 DDC FIELD OFFICE:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 A

A. OFFICE SPACE IN EXISTING BUILDING:

1. The Resident Engineer will arrange for office space for sole use in the building where work is in progress. The Contractor shall provide and install a lockset for the door to secure the equipment in the room. The Contractor shall provide two (2) keys to the Resident Engineer. After completion of the project the Contractor shall replace the original lockset on the door and ensure its proper operation.
2. In addition to equipment specified in Sub-Section 3.8 D, the Contractor shall provide, for exclusive use of the DDC Field Office, the following:
   a. Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two metal (2) lockers, single units, 15" x 18" x 78" overall including 6" legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks, approximately 52"H x 28 ½"D x 18"W.
   b. One (1) 9000 B.T.U air conditioner or as directed by Commissioner. Wiring for the air conditioner shall be minimum No. 12 AWG fed from individual circuits in the fuse box.
   c. One (1) folding conference table, 96" x 30" and ten (10) folding chairs.
   d. Two (2) metal wastebaskets.
   e. One (1) fire extinguisher, one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
   f. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the project as required.
3. The Contractor shall provide one (1) telephone, where directed and shall pay all costs for telephone service for calls within the New York City limits for the duration of the project.
4. All furniture and equipment, except computer equipment specified in Sub-Section 3.8 D.3, shall remain the property of the Contractor.
5. Computer Workstation quantities shall be provided as specified in Sub-Section 3.8 B 3-a for DDC Managed Projects, or Sub-Section 3.8 B 3-b for CM Managed Projects.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 B

B. DDC FIELD OFFICE TRAILER:

1. GENERAL: The Contractor shall, for the time frame specified herein, provide and maintain at its own cost and expense a DDC Construction Field Office and all related items as specified herein [hereinafter collectively referred to as the "DDC Field Office"] for the exclusive use of the Resident Engineer. The DDC Field Office shall be located at the Project site and shall be solely dedicated to the Project. Provision of the DDC Field Office shall commence within THIRTY (30) days from Notice to proceed and shall continue through forty-five (45) days after Substantial Completion of the required construction at the Project site. The Contractor shall remove the DDC Field Office forty-five (45) days after Substantial Completion of the required construction, or as otherwise directed in writing by the Commissioner.
2. TRAILER: The Contractor shall provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor shall install and connect all utility services to the

trailer within thirty (30) days from Notice to Proceed. The trailer shall have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer shall be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in Sub-Section 3.8D.3 herein, shall remain the property of the Contractor.

3. Trailer shall be an office type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction shall be minimum 2 x 4 wall construction fully insulated with paneled interior walls, pre-finished gypsum board ceilings and vinyl tile floors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8.B.3a or SUB-SECTION 3.8.B.3b.

a. DDC Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:
   1) Overall length: 32 Feet
      Overall width: 10 Feet
   2) Interior Layout:
      Provide one (1) general office/conference room area and one (1) private office at one end of the trailer. Provide equipment and amenities as specified in Sub-Section 3.8.B herein.
   3) Computer Workstation: Provide one (1) complete computer workstation, as specified in Sub-Section 3.8.D herein, in the private office area as directed by the Resident Engineer.

b. CM Managed Project Trailer: DDC Field Office Trailer Size, Layout and Computer Workstation:
   1) Overall length: 50 Feet
      Overall width: 10 Feet
   2) Interior Layout:
      Provide one (1) large general office/conference room in the center of the trailer and two (2) private offices, one (1) each at either end of the trailer. Provide equipment and amenities as specified in Sub-Section 3.8.B herein.
   3) Computer Workstation:
      Provide three (3) complete computer workstations as specified in Sub-Section 3.8.D herein. Provide one (1) each complete computer workstation in each private office and one (1) complete computer workstation at the secretarial position as directed by the Resident Engineer.

4. The exterior of the trailer shall be lettered with black block lettering of the following heights with white borders:

CITY OF NEW YORK	2-1/2"
DEPARTMENT OF DESIGN AND CONSTRUCTION	3-3/4"
DIVISION OF PUBLIC BUILDINGS	3-1/2"
DDC FEILD OFFICE	2-1/2"

NOTE: In lieu of painting letters on trailer the Contractor may substitute a sign constructed of a good quality weatherproof material with the same type and size of lettering above.

5. All windows and doors shall have aluminum insect screens. Provide wire mesh protective guards at all windows.
6. The interior shall be divided by partitions into general and private office areas as specified herein. Provide a washroom located adjacent to the private office and a built-in wardrobe closet opposite the washroom. Provide a built-in desk in the private office(s) with fixed overhead shelf and clearance below for two (2) file cabinets.

7. Provide a built-in drafting or reference table, located in the general office/conference room, at least 60 inches long by 36 inches wide with cabinet below and wall type plan rack at least 42 inches wide.
8. The washroom shall be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies and a toilet roll tissue holder. Plumbing and fixtures shall be approved house type, with each appliance trapped and vented and a single discharge connection. Five (5) gallon capacity automatic electric heater for domestic hot water shall be furnished.
9. HVAC: The trailer shall be equipped with central heating and cooling adequate to maintain a temperature of 72 degrees during the heating season and 75 degrees during the cooling season when the outside temperature is 5 degrees F. winter and 89 degrees F. summer.
10. Lighting shall be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of 50 foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps shall be replaced by the Contractor. A minimum of four (4) duplex convenience outlets shall be provided in the open office and two (2) each in the private office(s). These outlets shall be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc.
11. Electrical service switch and panel shall be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation shall conform to the New York City Electrical Code.
12. The following movable equipment shall be furnished:
    a. Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks and two (2) full ball bearing two (2) drawer vertical legal filing cabinets in each private office located below built-in desk.
    b. One (1) folding conference table, 96" x 30" and ten (10) folding chairs.
    c. Three (3) metal wastebaskets.
    d. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.
    e. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.
13. TRAILER TEMPORARY SERVICE: Plumbing and electrical work required for the trailer will be furnished and maintained as below.

    a. PLUMBING WORK: The Contractor shall provide temporary water and drainage service connections to the DDC Field Office trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping.

       Contractor to frost-proof all water pipes to prevent freezing.
       1) REPAIRS, MAINTENANCE: The Contractor shall provide repairs for the duration of the project until the trailer is removed from the site.
       2) DISPOSITION OF PLUMBING WORK: At the expiration of the time limit set forth in Sub-Section 3.8 B 1 herein, the temporary water and drainage connections and piping to the DDC Field Office trailer shall be removed by the Contractor and shall be plugged at the mains. All piping shall become the property of the Contractor for Plumbing Work and shall be removed from the site, all as directed. All repair work due to these removals shall be the responsibility of the Contractor.

    b. ELECTRICAL WORK:
       1) The Contractor shall furnish, install and maintain a temporary electric feeder to the DDC Field Office trailer immediately after it is placed at the job site.
       2) The temporary electrical feeder and service switch/fuse shall be adequately sized based on the trailer load and installed per the New York City Electrical Code and complying with utility requirements.

3) Make all arrangements and pay all costs to provide electric service.
4) The Contractor shall pay all costs for current consumed and for maintenance of the system in operating condition, including the furnishing of the necessary bulb replacements lamps, etc., for the duration of the project and for a period of forty-five (45) days after the date of Substantial Completion.
5) Disposition of Electric Work: At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., shall be removed and disposed of as directed.
6) All repair work due to these removals shall be the responsibility of the Contractor.

c. MAINTENANCE
1) The Contractor shall provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the DDC Field Office in first-class condition, including all repairs, until the trailer is removed from the site.
2) Supplies: The Contractor shall be responsible for providing (a) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary supplies, and (b) all supplies in connection with required computers and printers, including without limitation, an adequate supply of blank CD's/DVD's, storage boxes for blank CDs/DVDs, and paper and toner cartridges for the printer.
3) Risk of Loss: The entire risk of loss with respect to the DDC Field Office and equipment shall remain solely and completely with the Contractor. The Contractor shall be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the Field Office.
4) At forty-five (45) days after the date of Substantial Completion, or sooner as directed by the Commissioner, the Contractors shall have all services disconnected and capped to the satisfaction of the Commissioner. All repair work due to these removals shall be the responsibility of the Contractor.

d. TELEPHONE SERVICE: The Contractor shall provide and pay all costs for the following telephone services for the DDC Field Office trailer:
1) Separate telephone lines for one (1) desk phone in each private office.
2) One (1) wall phone (with six (6) foot extension cord) at plan table.
3) Separate telephone lines for the fax machine and internet access in each private office. Telephone service shall include voice mail.
4) A remote bell located on outside of trailer
5) The telephone service shall continue until the trailer is removed from the site.

e. PERMITS: The Contractor shall make the necessary arrangements and obtain all permits and pay all fees required for this work.

C. RENTED SPACE: The Contractor has the option of providing, at its cost and expense, rented office or store space in lieu of trailer. Said space shall be in the immediate area of the Project and have adequate plumbing, heating and electrical facilities. Space chosen by the Contractor for the DDC Field Office must be approved by the Commissioner before the area is rented. All insurance, maintenance and equipment, including computer workstations specified in Sub-Section 3.8 D in quantities required as specified in Sub-Section 3.8 B 3 for the DDC Field Office trailer, shall also apply to rented spaces.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 D

D. ADDITIONAL EQUIPMENT FOR THE DDC FIELD OFFICE:
1. The Contractor shall provide a high volume copy machine (50 copies per minute) for paper sizes 8½ x 11, 8½ x 14 & 11 x 17. Copier shall remain at job site until the DDC Field office trailer is removed from the site.

2. The Contractor shall furnish a fax machine and a telephone answering machine at commencement of the project for the exclusive use of the DDC Field Office. All materials shall be new, sealed in manufacturer's original packaging and shall have manufacturers' warrantees. 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 equivalent. (Note: an approved equivalent requires written approval of the Assistant Commissioner of ITS.)
b) Processor:	i5-2400 (6MB Cache, 3.1GHz) or faster computer - Single Processor.
c) System RAM:	Minimum of 4GB (Gigabytes) Dual Channel DDR3 SDRAM at 1333MHz – 2 DIMMSs
d) Hard Disk Drive(s):	500 GB (Gigabytes) Serial ATA (7200RPM) w/DataBurst Cache, or larger.
e) CD-RW:	Internal CD-RW, 48x Speed or faster.
f) 16xDVD+/-RW	DVD Burner (with double layer write capability) 16x Speed or faster
g) I/O Ports:	Must have at least one (1) Serial Port, one (1) Parallel Port, and three (3) USB Ports.
h) Video Display Card:	HD Graphics (VGA, HDMI) with a minimum of 64 MB of RAM.
i) Monitor:	22" W, 23.0 Inch VIS, Widescreen, VGA/DVI LCD Monitor.
j) Available Exp. Slots:	System as configured above shall have at least two (2) full size PCI Slots available.
k) Network Interface:	Integrated 10/100/1000 Ethernet card.
l) Other Peripherals:	Optical scroll Mouse, 101 Key Keyboard, Mouse Pad and all necessary cables.
m) Software Requirement:	Microsoft Windows 7 Professional SP1, 32 bit; Microsoft Office Professional 2010 or 2013; Microsoft Project 2010; Adobe Acrobat reader; Anti-Virus software package with 2 year updates subscription; and, either Auto Cad LT or Microsoft

Visio Standard Edition, as directed by the Resident Engineer.

4) DDC Field Office Specs: DDC Field Offices requiring computers shall be provided with the following:
   a) One (1) broad-band internet service account. Wideband Internet connectivity at a minimum throughput of 15 Mbps download and 5 Mbps upload is required at each field office location with 1-5 staffers. For larger field offices see table below for minimum required upload speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

Office Personnel #	**Upload Speeds (*Minimum*)**
1 – 5	5 Mbps
6 – 10	10 Mbps
11 – 15	15 Mbps
16 – 20 …	20 Mbps

   This account will be active for the life of the project. The e-mail name for the account shall be the DDC Field Office/project Id (e.g. FLD K HWK666 McGuinness@earthlink.com).
   b) One (1) 600 DPI HP Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper (Legal Size)
   c) All necessary cabling for equipment specified herein.
   d) Storage Boxes for Blank CD's
   e) Printer Table
   f) UPS/Surge Suppressor combo

5) All computers required for use in the Engineer's Field Office shall be delivered, installed, and setup in the Field Office by the Contractor.

6) All Computer Hardware shall come with a three (3) year warranty for on-site repair or replacement. Additionally, and notwithstanding any terms of the warranty to the contrary, the Contractor is responsible for rectifying all computer problems or equipment failures within one (1) business day.

7) An adequate supply of blank CDs/DVDs, and paper and toner cartridges for the printer shall be provided by the Contractor, and shall be replenished by the Contractor as required by the Resident Engineer.

8) It is the Contractor's responsibility to ensure that electrical service and phone connections are also available at all times; that is, the Field Office Computer(s) is to be powered and turned on twenty-four (24) hours each day.

9) Broadband connectivity is preferred at each field office location. Please take into consideration that an extra phone line dedicated to the modem must be ordered as part of the contract unless Internet broadband connectivity, via Cable or DSL, is available at the planned field office location. Any questions regarding this policy should be directed to the Assistant Commissioner of Information Technology Services at 718-391-1761.

10) Ownership: The equipment specified above shall, unless otherwise directed by the Commissioner, be the sole property of the City of New York upon delivery to the DDC Field Office. The Contractor shall prepare and maintain an accurate inventory of all equipment which it purchases for the DDC Field Office. Such inventory shall be provided to the City of New York. Upon completion of the

required services, as directed by the Commissioner, the Contractor shall turn such equipment over to the City of New York.

E. HEAD PROTECTION (HARD HATS):
1. The Contractor shall provide a minimum of 10 standard protective helmets for the exclusive use of Department of Design and Construction personnel and their visitors. Helmets shall be turned over to the Resident Engineer and kept in the DDC Field Office.
2. Upon completion of the project, the helmets shall become the property of the Contractor.

3.9 MATERIAL SHEDS:

A. Material sheds used by the Contractor for the storage of its materials shall be kept at locations which will not interfere at any time with the progress of any part of the work or with visibility of traffic control devices.

B. Store combustible materials apart from the facility.

3.10 TEMPORARY ENCLOSURES:

A. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

B. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

3.11 TEMPORARY PARTITIONS:

A. Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with 2 layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
   a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
3. Insulate partitions to provide noise protection to occupied areas.
4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
5. Protect air-handling equipment.
6. Weather strip openings.
7. Provide walk-off mats at each entrance through temporary partition.

3.12 TEMPORARY FIRE PROTECTION:

A. Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

B. Prohibit smoking in all areas.

C. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

D. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

E. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 WORK FENCE ENCLOSURE:

A. The Contractor shall furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the drawings or required by the work enclosing the entire project on all sides. All materials used shall be new. Any permit required for the installation and use of said fence and costs shall be borne by the Contractor.

B. WOOD FENCE shall be 7'-0" high with framing construction of yellow pine, using 4" x 4" approved preservative-treated posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which shall be secured minimum 1/2 inch thick exterior grade plywood. Posts shall be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence shall be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed.

1. GATES - Provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates shall have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts shall be 6" x 6" and shall extend high enough to receive and be provided with tension or sag rods for the swinging sections.
2. PAINTING - The fence and gates shall be entirely painted on the street and public sides with one (1) coat of exterior primer and one (1) top coat of exterior grade acrylic-latex emulsion paint. Black stenciled signs reading "POST NO BILLS" shall be painted on fence with three (3) inch high letters on 25 foot spacing for the entire length of fence on street traffic sides. Signs shall be stenciled five (5) feet above the sidewalk.

C. CHAIN-LINK FENCING shall be minimum 2-inch thick, galvanized steel, chain-link fabric fencing; 8 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence shall be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition shall fencing be attached or anchored to existing construction or trees.

D. 1. It shall be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.
2. Should the fencing be required to be relocated during the course of the Contract, it shall be done by the Contractor at no additional cost to the City.
3. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad shall be provided for protection of sidewalks and curbs.
4. Where required, make provision for fire hydrants, lampposts, etc.
5. REMOVAL - When directed by the Resident Engineer, the fence shall be removed.

3.14 RODENT AND INSECT CONTROL:

A. DESCRIPTION: The Contractor shall provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and to control any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the project area. Special attention should be paid to the following conditions or areas:

1 Wet areas within the project area, including all temporary structures.
2 All exterior and interior temporary toilet structures within the project area.
3 All Field Offices and shanties within the project area of all subcontractors and DDC.
4 Wherever there is evidence of food waste and/or discarded food or drink containers, in quantity, that would cause breeding of rodents or the insects herein specified.
5 Any other portion of the premises requiring such special attention.

B. MATERIALS:

1 All materials shall be approved by the New York State Department of Environmental Conservation and comply with the New York City Health Code, OSHA and the laws, ordinances and regulations of State and Federal agencies pertaining to such chemical and/or materials.

C. PERSONNEL:

1 All pest control personnel must be supervised by an exterminator licensed in categories 7A and 8.

D. METHODS:

1. Application and dosage of all materials shall be done in strict compliance with the manufacturer's recommendations.
2. Any unsanitary conditions, such as uncollected garbage or debris, resulting from all Contractor's activities, which will provide food and shelter to the resident rodent population shall be corrected by the Contractor immediately after notification of such condition by the Resident Engineer.

E. RODENT CONTROL WORK:

1 In wetlands, woodlands and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait shall be used in areas within seventy-five (75) feet of all stream banks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.
2 In areas outside the seventy-five (75) foot zone of protection adjacent to streams, and in areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait shall be placed during the period of construction and any consumed or decomposed bait shall be replenished as directed.
3 At least one month prior to initiation of the construction work, and periodically thereafter, live traps and/or rodenticide bait in tamper proof bait stations, as directed above, shall be placed at locations that are inaccessible to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the project area.
4 The Contractor shall be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper proof bait stations. The Contractor shall also be responsible for posting and maintaining signs announcing the baiting of each particular location.
The Contractor shall be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the project area.
5 It is anticipated that public complaints will be addressed to the Commissioner. The Contractor, where directed by the Commissioner, shall take appropriate actions, like baiting, trapping, proofing, etc., to remedy the source of complaint within the next six (6) hours of normal working time which is defined herein for the purposes of this section as 7 A.M. to 6 P.M. on Mondays through Saturdays.
6 Emergency service during the regular workday hours (Monday through Friday) shall be rendered within 24 hours, if requested by the Commissioner, at no additional cost to the City.

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:

NO TRESPASSING

AUTHORIZED PERSONNEL ONLY

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 ½" 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-SETION 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

No Text

SECTION 01 54 11
TEMPORARY ELEVATORS AND HOISTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
   1. Temporary Use, Operation and Maintenance of Elevators during Construction
      a. For New buildings up to 15 Stories
      b. For New buildings over 15 Stories
      c. For Existing Buildings
   2. Temporary Construction Hoists and Hoist ways (For Material and Personnel)

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 42 00 REFERENCES
C. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS
D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING
E. Section 01 77 00 CLOSE OUT PROCEDURES

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.1

3.1 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDINGS UP TO AND INCLUDING 15 STORIES:

A. INSTALLATION: The Contractor shall install, complete, operate, and maintain in good working order, as indicated herein, one (1) selected main elevator for the transport of employees of the Contractor and/or its subcontractors, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall furnish, install, and maintain such elevator in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor shall be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor shall be responsible for all costs in connection with the temporary elevator, including without limitation: (1) installing and operating the temporary elevator, (2) maintaining the temporary elevator in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) performing all work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevator, (4) replacing the temporary elevator or any equipment or parts utilized in connection therewith, if required, due to damage, destruction or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below, (5) performing all required electrical work in connection with the temporary elevator, (6) providing all electric power required to operate the temporary elevator, (7) providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevator, and (8) providing all labor for the operation and maintenance of the temporary elevator, including on an overtime basis if necessary. The total Contract Price shall include all costs in connection with the temporary elevator, including without limitation, the costs specified herein.

D. COMMENCEMENT OF SERVICE: The Contractor shall begin to provide temporary elevator service using the selected main passenger elevator no later than eight (8) weeks (40 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed the following work shall have been completed:

1. The shaft shall have been completely enclosed by either the permanent or a temporary enclosure meeting the requirements of the law.
2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.
3. There shall have been installed on all floors at the shaft way entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks and any necessary approved wire mesh barricades for adjacent shaft ways.
4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.

E. ELECTRICAL INSTALLATION: The Contractor, not later than 20 calendar days after the machine room roof slab or that portion of its surrounding the elevator has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected such feeders to the terminals on the starter panels or controllers in the machine room to the low voltage transformers and car light outlets in the center of shaft way and for the car control and signal traveling cables. The Contractor shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

F. REMOVAL: When elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor shall remove the temporary enclosures and all temporary elevator equipment and promptly proceed with the installation of the permanent equipment as required under the Contract.

G. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment shall be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection deems it necessary, the Contractor shall furnish and install new governor and compensating ropes, new traveling cables and new controller parts, etc. The car and counterweight safeties shall be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.

H. REPLACEMENT: The Contractor shall furnish and install new equipment or parts for any equipment or parts of the temporary elevator installation that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly cleaned. Where lubricated rails are used they shall be washed down. If roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., shall be borne by the Contractor except for the replacement of hoisting ropes.

I. LIMITATIONS ON USE: The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation, but only after such times as all plastering has been completed from the second floor up. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

J. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of $100 per day for each day it fails to provide the temporary elevator service described in this section beginning with the 41st working day after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDING OVER 15 STORIES:

A. INSTALLATION: The Contractor shall install, complete, operate, and maintain in good working order, as indicated herein, two (2) selected main elevators for the transport of employees of the Contractor and/or its subcontractors, and representatives of the DDC and other Governmental Agencies having jurisdiction of work at the project. The Contractor shall furnish, install, and maintain such elevators in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation and maintenance of the temporary elevators and all equipment and/or parts utilized in connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use. The two (2) elevators shall not be operated simultaneously.

B. RESPONSIBILITY: The Contractor shall be responsible for any injury to persons or damage to property arising out of the temporary elevators and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor shall be responsible for all costs in connection with the temporary elevators, including without limitation: (1) installing and operating the temporary elevators, (2) maintaining the temporary elevators in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance, (3) performing all work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevators, (4) replacing the temporary elevators or any equipment or parts utilized in connection therewith, if required due to damage, destruction or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below, (5) performing all required electrical work in connection with the temporary elevators, (6) providing all electric power required to operate the temporary elevators, (7) providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevators, and (8) providing all labor for the operation and maintenance of the temporary elevators, including on an overtime basis if necessary. The total Contract Price shall

include all costs in connection with the temporary elevators, including without limitation, the costs specified herein.

D. LOW RISE ELEVATOR: The Contractor shall begin to provide temporary elevator service using one (1) selected main passenger elevator no later than six (6) weeks (30 working days) after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. No later than one (1) week, five (5) working days, after the 12th Floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped the following work shall have been completed:

1. The shaft shall have been completely enclosed up to the 12th Floor by either the permanent or a temporary enclosure meeting the requirements of the law.

2. A temporary machine room enclosure shall have been provided at the 11th Floor and shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.

3. There shall have been installed on all floors up to and including the 9th Floor at the shaft entrances to the elevator, solid substantial wood frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaft ways.

4. There shall have been furnished and installed solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.

E. ELECTRICAL INSTALLATION: The Contractor not later than 10 calendar days after the 12th Floor slab or that portion of it surrounding the elevator, has been poured and stripped, shall have furnished and installed temporary or permanent power and light feeders as required for the elevator used for temporary service and shall have connected such feeders to the terminals on the starter panels or controllers in the temporary machine room, to the low voltage transformers and car light outlets in the center of the shaftway and for the car control and signal traveling cables. The Contractor shall make all these required connections as soon as the Equipment is declared ready for such connections by the Resident Engineer.

F. HIGH RISE ELEVATOR: The Contractor shall begin to provide temporary elevator service to all floors, using a selected main passenger elevator, no later than eight (8) weeks (40 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (15 working days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed, the following work shall have been completed:

1. The shaft shall have been completely enclosed by either the permanent or temporary enclosure, meeting the requirements of the law.

2. The machine room shall have been made completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary shall be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.

3. There shall have been installed on all floors at the shaft way entrances to the elevator, solid substantial frames and either sliding or swing doors with substantial hardware and door locks, also any necessary approved wire mesh barricades for adjacent shaft ways.

4. There shall have been furnished and installed, solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, excepting that the portion of the front at the elevator entrance shall have been provided with a substantial temporary door or gate.

G. ELECTRICAL INSTALLATION: The Contractor, not later than 20 calendar days after the machine room slab or that portion of it surrounding the elevator shaft has been placed, shall have furnished and installed temporary or permanent power and light feeders as required for the high rise elevator to be used for

temporary service and shall have connected such feeders to the terminals on the motor-generator starter panels or controllers in the machine room, to the signal circuits low voltage transformers for the annunciators and car light outlets in the center of shaft way. The Contractor shall make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

H. When the high rise elevator is completed and ready for temporary operation, the low rise temporary elevator shall be shut down.

I. REMOVAL: When one (1) or more elevators for permanent use have been installed and are in condition for service, and when directed by the Commissioner, the Contractor shall remove the temporary enclosures and all temporary elevator equipment, and promptly proceed with the installation of the permanent equipment as required under the Contract.

J. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment shall be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection determines it necessary, the Contractor shall furnish and install new governor and compensating ropes, new traveling cables, new controller parts, etc. The car and counterweight safeties shall be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.

K. REPLACEMENT: The Contractor shall furnish and install new equipment or parts for any equipment or parts of the temporary elevator installations that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheaves spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall be washed down, if roller guides are used, all rust, dirt, etc., must be removed from the rails. The full cost of parts replacement cleaning, etc., shall be borne by the Contractor except for the replacement of hoisting ropes.

L. LIMITATIONS ON USE: The temporary elevators shall not be used during their operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation, but only after such times as all plastering has been completed from the second floor up. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

M. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of $100 per day for each day it fails to provide the temporary elevator service described in this Section beginning with the 31st working day after the 12th Floor slab, or that portion of the 12th Floor slab surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR EXISTING BUILDINGS:

A. The Contractor may use, at the Commissioner's discretion, one (1) selected elevator in the building for temporary operation by the Contractor for the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction over the work at the Project. The operation of the temporary elevator and all equipment and/or parts utilized in

connection therewith shall be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor shall be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. REPLACEMENT: The Contractor shall furnish and install new equipment or parts for any equipment or parts of the elevator for temporary operation that have been damaged, destroyed, or that indicate excessive wear or corrosion, excepting the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators shall be thoroughly cleaned down. Where lubricated rails are used they shall be washed down, if roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., shall be borne by the Contractor except for the replacement of hoisting ropes. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes shall be installed and payment therefore will be made in accordance with Article 26 of the Contract.

D. LIMITATIONS ON USE: The temporary elevator shall not be used during its operation for the hoisting of materials or the removal of rubbish, but shall be limited only to the transportation of employees of the Contractor and/or its subcontractors, and representatives of DDC and other Governmental Agencies having jurisdiction of work at the project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor shall notify the Resident Engineer within 24 hours after such damage has occurred. As indicated above, the Contractor shall be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

E. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of $100 per day for each day it fails to provide elevator services described in this section beginning with 15 consecutive calendar days from Notice to Proceed. This charge will be deducted from any amount due and owing to the Contractor.

3.4 TEMPORARY HOISTS AND HOISTWAYS (FOR MATERIAL AND PERSONNEL):

A. RESPONSIBILITY: The Contractor shall provide adequate numbers of material hoists for the most expeditious performance of all parts of the work including the work of all its subcontractors.

B. LOCATIONS: No hoists shall be constructed at such locations as will interfere with, or affect the construction of, floor arches, or the work of subcontractors. The hoists may be located at the exterior sides of the structure or in the courtyard and extend upward adjacent to the line of window openings. The hoists shall be located a sufficient distance from the exterior walls and be so protected as to prevent any of the permanent work from being damaged, stained or marred.

C. ELEVATOR SHAFT: Wherever possible, one or more of the permanent elevator shafts may be used as temporary hoist ways, providing such use complies with the requirements of the Building Code of the City of New York and has been approved by the Commissioner, and providing further it entails no interference with the progress of the work.

D. PROTECTION FOR INTERIOR HOISTS: All interior material hoist ways shall be enclosed on each floor and shall be adequately protected with appropriate safety guards. In no event shall the protection be less than that required by law.

END OF SECTION 01 54 11

SECTION 01 54 23
TEMPORARY SCAFFOLDING AND PLATFORMS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Section 01 35 26: Safety Requirements Procedures.

C. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements*". This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Temporary Scaffolding and Platforms, including:

1. Conformance
2. Responsibility
3. Jobsite Documentation and Submittals
4. Inspections

B. This Section governs ALL scaffold used on DDC project sites including, but not limited to, Suspended Scaffold, Supported Scaffold and Sidewalk Sheds.

1.3 CONFORMANCE:

A. Unless otherwise indicated, the Contractor is responsible for providing, erecting, installing and maintaining all temporary scaffolding and platforms which shall comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the NYC Building Code, NYC Local Law 52 of 2005, OSHA Construction Standard 1926 Subpart L, and furnishing the items and personnel set forth in this section.

1.4 RESPONSIBILITY:

A. Jobsite Safety Coordinator: The Contractor shall designate and employ a Jobsite Safety Coordinator, who shall be a competent person, who shall have a daily presence on the project site during scaffold use. This designee must possess and maintain a valid New York City Department of Buildings supported scaffold certificate of completion. An alternate shall also be designated, in the event that the Jobsite Safety Coordinator is absent. The Jobsite Safety Coordinator shall:

1. Verify completeness of documentation and submittals (as described below).
2. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected.
3. Monitor trades using scaffold.
4. Limit access to scaffold areas that are tagged for non-use.
5. Inform trades of scaffold load limitations.
6. Monitor loading of decks.
7. Verify that any ties that are temporarily removed are properly restored in the same shift.
8. Verify that outriggers and planks that are moved are properly set up and secured.
9. Verify that all scaffold decks in use have proper access/egress.
10. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards.

11. Notify appropriate parties, including but not limited to the Resident Engineer, site safety coordinator / monitor, site safety consultant, scaffold users, contractor and the scaffold engineer, of misuses, non-conformances, hazards and accidents.
12. Keep a log of significant actions and events connected with the scaffolding.

B. The Contractor shall be responsible for erecting, maintaining and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the New York City Building Code, OSHA and the Contract documents, including the specifications. The Contractor shall also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.

C. The Contractor shall require the subcontractor responsible for erecting the scaffolding to engage a Scaffold Engineer, licensed as a professional engineer by the State of New York. The Scaffold Engineer shall be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the New York City Building Code and OSHA, (2) that the design comports with the capabilities of the components and the characteristics of the site, (3) that scaffold loads on the host building, including netting, have been properly considered, and (4) that the design documents provide accurate information for erectors and users.

D. Scaffold users are trade contractors assigned to work on the scaffold. Training certificates from a New York City Department of Buildings approved training provider are mandatory. These users have the duty to become familiar with the New York City Building Code and OSHA requirements germane to users, to obey the instructions of the Jobsite Safety Coordinator and to inform the Jobsite Safety Coordinator of known hazards, non-conformances or violations.

1.5 JOBSITE DOCUMENTATION AND SUBMITTALS:

The Contractor shall prepare, obtain and submit the following to the Resident Engineer:

A. NYC Department of Buildings permit(s) for scaffold and sidewalk sheds (as applicable) including filing applications signed and sealed by a Professional Engineer licensed in the State of New York;

B. Site logistics plan / site safety plan;

C. Installation drawing(s), design and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:

1. Plan(s);
2. Elevation(s);
3. Duty load designation; "standard" (150 psf live load) or "heavy duty" (300 psf live load).
4. Details including base support, anchors and ties;
5. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal.
6. Anchorage into sound material.
7. Load limits based on pull tests;
8. Specifications for pull test(s), method, proof load and the number of trials;
9. Elevations, levels or heights, where anchorage is made into masonry;
10. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
11. Samples for anchors, ties and netting;
12. Sequence of operations for erection and demolition;
13. Location plan, heights, widths, "jumps" over doorways and driveways;
14. Specify size, maximum span and maximum spacing of headers and stringers;
15. Specify legs, girts, braces, nailing and connections;
16. All sidewalk sheds shall be designed, engineered, signed and sealed by a Professional Engineer licensed in the State of New York;
    a. Generic (not job specific) engineering drawings are satisfactory for standard sheds and arrangements.

b. Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

1.6 INSPECTIONS:

A. Signed inspection reports shall be issued for each inspection and pull-test below, and shall be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the project.

B. Pull testing shall be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer shall specify the test method, proof load and the number of trials.

C. Sidewalk sheds shall be inspected after initial installation, major modification, or damage and thence every three months. Inspections shall be by a Scaffold Engineer for custom sheds and by a Competent Person employed by the Contractor for standard sheds.

D. Scaffolds shall be inspected by the Scaffold Engineer during erection, post-erection and prior to use and thence every three months. The Scaffold Engineer shall repeat inspections after major alteration/modification, damage.

E. A Qualified Person assigned by the Contractor shall inspect the progress of erection and dismantling, and the condition and integrity of the sidewalk sheds after high winds, major storms and at least once per month during usage.

F. A Qualified Person assigned by the Contractor shall inspect the progress of erection and dismantling at least weekly, and the condition and integrity of the scaffold after high winds, major storms and at least once per month during usage.

G. Scaffolds and Sidewalk Sheds shall be inspected daily by the Jobsite Safety Coordinator or alternate prior to use by scaffold users. The inspection results must be recorded in the maintenance log, and be available on-site at all times.

H. At the completion of the project, submit all inspection documents as Miscellaneous Record Documents in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS.

1.7 LADDERS AND STAIRS:

A. The Contractor shall provide and maintain ladders or temporary stairs extending from the street to the first story, and to and from every floor and roof level of the project.

1.8 ACCESS AND EXITS:

A. The ladders or temporary stairs shall be of acceptable size, number and location, so that proper and convenient access may be had by those required to proceed to and from all parts of the project.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23

No Text

SECTION 01 73 00
EXECUTION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes general procedural requirements governing execution of the Work including without limitation the following:

1. Delivery of Materials
2. Contractor's Superintendent
3. Surveys
4. Borings
5. Examination
6. Environmental Assessment
7. Preparation
8. Deferred Construction
9. Installation
10. Permits
11. Transportation
12. Sleeves and Hangers
13. Sleeve and Hanger Drawings
14. Cutting and Patching
15. Location of Partitions
16. Furniture and Equipment
17. Removal of Rubbish and Surplus Material
18. Cleaning
19. Security And Protection of Work Site
20. Maintenance of Site and Adjoining Property
21. Maintenance of Project Site
22. Safety Precautions for Control Circuits
23. Obstructions in Drainage Lines

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 QUALITY ASSURANCE:

A. Land Surveyor Qualifications: A professional land surveyor who is licensed in the State of New York and who is experienced in providing land-surveying services of the kind indicated.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 DELIVERY OF MATERIALS:

A. Material Orders: The Contractor shall furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and shall also notify the Commissioner when materials have been delivered to the site and in what quantities.

B. Ample Quantities: The Contractor shall deliver materials in ample quantities to insure the most prompt and uninterrupted progress of the work so as to complete the work within the Contract time.

C. Containers: The manufacturer's containers shall be delivered with unbroken seals and shall bear proper labels.

D. Deliveries: The Contractor shall coordinate deliveries in order to avoid delaying or impeding the progress of the work.

E. Handling: The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage.

1. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.
2. Promptly return damaged shipments or incorrect orders to manufacturer.
3. For materials or equipment to be reused or salvaged, use special care in removal, storage and reinstallation to insure proper function in completed work.

F. Storage: Store products in accordance with provisions of Article 3.1, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.

G. Stacking: All materials shall be properly stacked in convenient places adjacent to the site, or where directed, and protected in a satisfactory manner. Stacked materials shall be so arranged as to not interfere with visibility of traffic control devices.

H. Overloading: If authority is given to store materials in any part of the project area, they shall be so stored as to cause no overloading.

I. No Interference: If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the work or interfering with the work to be done by any trade subcontractor, the Contractor shall remove and restack such materials at no additional cost to the City.

3.2 CONTRACTOR'S CONSTRUCTION SUPERINTENDENT:

A. Contractor's Construction Superintendent: The Contractor shall devote its time and personal attention to the work and shall employ and retain at the project site, from the commencement until the entire completion of the work, a Contractor's Construction Superintendent. The Contractor's Construction Superintendent shall be registered with the New York City Department of Buildings in compliance with the Construction Superintendent Rule of the City of New York and shall be competent and capable of maintaining proper supervision and care of the work and shall be acceptable to the Commissioner. The Construction Superintendent shall, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any subcontractor, shall see that the instructions of the Commissioner are carried out.

B. Replacement: The Contractor's Construction Superintendent on the job shall not be changed or removed without the consent of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 SURVEYS:

A. Line and Grade: The City will establish a baseline and bench mark near the site of the work for use of the Contractor in connection with the performance of the work.

B. Responsibility: The Contractor shall establish all other lines and elevations required for its work and shall be solely responsible for the accuracy thereof.

C. Safeguard All Points: The Contractor shall safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the work, shall re-establish same if disturbed and bear the entire expense of rectifying the work improperly installed due to not maintaining, not protecting or removing without authorization such established points, stakes, or marks.

D. City Monuments and Markers: No work shall be performed near City monuments or marks so as to disturb them until the said monuments or marks have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.

E. Foundations: The Contractor shall furnish certification from a licensed Surveyor that all portions of the foundation work are located in accordance with the Contract Drawings and at the elevations required thereby. This certification shall show the actual locations and the actual elevations of all the work in relation to the locations and elevations shown on the Contract Drawings, including but not restricted to the following:

1. The locations and elevations of all piles, if any.
2. Elevations of tops of all spread footings, tops of pile caps, and tops of all foundation walls, elevator pit walls and ramp walls.
3. Location of all footing centers and pier centers including those for exterior wall columns.
4. Location of all foundation walls including wall columns, elevator pit walls and ramp walls.

F. Wall Lines: After the first courses of masonry or stone have been laid, the Contractor shall establish the permanent lines of exterior walls. The Contractor shall furnish promptly, certification from a licensed Surveyor, in the form of signed original drawings showing the exact location of such wall lines, of all portions of all structures. Except at its own risk, the Contractor shall not proceed further with the erection of walls until the Surveyor's certification has been submitted and verified for correct location of wall lines.

G. Surveyor: The Surveyor selected for any of the purposes mentioned in Paragraph E and Paragraph F above, and Paragraph I below, shall be a land Surveyor licensed in the State of New York and shall be subject to the approval of the Commissioner. The Surveyor shall not be a regular employee of the Contractor, nor shall the Surveyor have any interest in the Contract. The Surveyor shall not be employed by the Contractor in laying out any work, it being intended that the Surveyor's certification shall represent an independent and disinterested verification of such layout. The Surveyor shall report to the Department of Design and Construction's Resident Engineer each time upon arrival to and departure from the site and review with the Resident Engineer the data required for the project.

H. Final Certification: Final certification shall be submitted upon completion of the work or upon completion of any subdivision of the work as directed by the Commissioner. Any exceptions or deviations from the drawings shall be noted on the final certificate and there shall be included any maps, plates, notes, pertinent documents and data necessary, in the opinion of the Commissioner, to constitute a full and complete report.

I. Final Survey: The Contractor shall submit to DDC for submission to the Department of Buildings a final Survey by the licensed Surveyor showing the location of the new Structure, before completion of the Structure. This Survey shall show the location of the first tier of beams or of the first floor; the finish grades of the open spaces on the plot; the established curb level and the location of all other Structures on the plan, together with the location and boundaries of the lot or plot upon which the Structure is constructed, curb cuts, all yard dimensions, etc.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 BORINGS:

A. The work of this article shall be the responsibility of the Contractor unless otherwise indicated.

B. Reference Drawings: The Boring Drawings as listed on the title sheet are for information to the bidder and are to be used under the conditions as follows:

1. Boring Logs: shown on the Boring Drawings, record information obtained under engineering supervision in the course of exploration carried out by or under the direction of forces of the Department of Design and Construction at the site.

2. Soils and Rock Samples: All inferences are drawn from the indications observed as made by engineering and scientific personnel. All such inferences and all records of the work including soil samples and rock cores, if any, are available to bidders for inspection.

3. Certification of Samples: The City certifies that the work was carried out as stated, and that the soil samples and rock cores, if any were referred to, were actually taken from the site at the times, places and in the manner indicated. The samples are available for inspection in the Department of Design and Construction Subsurface Exploration Section.

4. Bidder's Responsibility: The bidder, however, is responsible for any conclusions to be drawn from the work. If the bidder accepts those of the City, it must do so at its own risk. If the bidder prefers not to assume such risk, the bidder is under the obligation of employing its own experts to analyze the available information, and must be responsible for any consequences of acting on their conclusions.

5. Continuity Not Guarantee: The City does not guarantee continuity of conditions shown at actual boring locations over the entire site. Where possible, borings are located to avoid all obstructions and previous construction which can be found by inspection of the surface and the bidder is required to estimate the influence of such features from its own inspection of the site.

3.5 EXAMINATION:

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground utilities and other construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with the subcontractor responsible for installation or application present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.6 ENVIRONMENTAL ASSESSMENTS:

A. City Responsibilities: An Environmental Assessment and survey is performed by the NYC DDC and its findings are included in the Contract Documents. In accordance with the NYC Administrative Code Title 15 Chapter 1 an asbestos survey is required to be performed by an Asbestos Investigator certified by the NYC Department of Environmental Protection (DEP) to identify the presence of asbestos containing material (ACM) prior to any alteration, renovation or demolition activity. The findings of such survey are required for the submission of approvals and permits issued by the NYC Department of Buildings (DOB). When the findings indicate that asbestos containing material is present and will be disturbed during the alteration, renovation or demolition activity then abatement design specifications will be incorporated into the contract documents. The Contractor shall comply with all federal, state and local asbestos regulations affecting the work for this Contract.

B. Contractor Responsibility: The Contractor shall comply with all federal, state and local environmental regulations, including without limitation USEPA and OSHA regulations which require the Contractor to assess if lead based paint will be disturbed during the work in order to protect his/her workers and the building occupants from migration of lead dust into the air. The Contractor shall comply with all federal, state and local environmental waste disposal regulation which may be required during the work. The Contractor is required to hire licensed abatement and disposal companies for the requisite work.

3.7 PREPARATION:

A. Field Measurements: The Contractor shall verify all dimensions and conditions on the job so that all work will properly join the existing work.

B. The Contractor, before commencing work, shall examine all adjoining work on which its work is in any way dependent on good workmanship in accordance to the intent of the Specifications and the Contract

Drawings. The Contractor shall report to the Commissioner any condition that will prevent it from performing work that conforms to the required standard.

C. Existing Utility Information: Furnish information to the Commissioner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.8 DEFERRED CONSTRUCTION:

A. Where necessity for deferred construction is certified by the Commissioner, in order to permit the installation of any item or items of equipment required to be furnished and installed concurrent with the time allowed for doing and completing the work of the Contract, the Contractor shall defer construction work limited to adequate areas as approved by the Commissioner.

B. The Contractor shall confer with the affected trade subcontractors and ascertain arrangements, time and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

3.9 INSTALLATION:

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work and work of trade subcontractors to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Design Consultant.

   2. Allow for building movement, including thermal expansion and contraction.

   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.10 PERMITS:

A. The Contractor shall comply with all local, state and federal laws, rules and regulations affecting the Work of this Project, including, without limitation, (1) obtaining all necessary permits for the performance of the Work prior to commencement thereof, and (2) complying with all requirements for the disposal of demolition and/or construction debris, waste, etc., including disposal in City landfills. The Contractor shall be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

3.11 TRANSPORTATION:

A. Availability: It shall be the duty of the Contractor to determine the availability of transportation facilities and dockage for the use of its employees, equipment and material and the conditions under which such use will be permitted.

B. Costs: If transportation facilities and dockage are available and are permitted to be used by the governmental agency having jurisdiction, the Contractor shall pay all necessary costs and expenses, and abide by all rules and regulations promulgated in connection therewith.

C. Vehicles: With respect to the use of vehicles on highways and bridges, the Contractor's attention is directed to the limitations set forth in the Rules of the City of New York, Title 34, Chapter 4, Section 4-15.

D. Continued Use: It is understood that the Commissioner makes no warranty as to the continued use by the Contractor of such facilities.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.12

3.12 SLEEVES AND HANGERS:

A. Coordinate with Progress Schedule: The Contractor shall promptly furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment that is to be built into the work in conformity with the requirements of the project.

B. Cooperation of Subcontractors: All subcontractors shall fully cooperate with each other in connection with the performance of the above work as "cutting in" new work is neither contemplated nor will it be tolerated.

C. Timeliness: In the event that timely delivery of sleeves and other materials cannot be made, and to avoid delay, the Contractor may arrange to have boxes or other forms set at the locations where the piping or other material is to pass through or into the slabs, walls or other work. Upon the subsequent installation of the sleeves or other material, the Contractor shall fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in shall be borne by the Contractor.

D. Inserts: The Contractor is to install strip inserts four (4) foot on center and perpendicular to beams in ceiling slabs of boiler, machine and mechanical equipment rooms. Inserts are to be installed for strippable concrete slabs only.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 SLEEVE AND PENETRATION DRAWINGS:

A. As soon as practicable after the commencement of work and when the order in which concrete for the first slabs, walls, etc. to be poured is determined, the Contractor shall submit to the DDC a sketch indicating the location and size of all penetrations for sleeves, ducts, etc. which will be required to accommodate the mechanical trades, in order to determine if such penetrations will materially weaken the project's structure. The sketch shall be stamped and returned if approved and/or comments will be transmitted. The Contractor shall continue to submit sketches as the pouring schedule and the concrete work progresses and, until approvals for the penetration sketches have been given. The Contractor shall not predicate its layout work on unapproved sketches.

3.14 CUTTING AND PATCHING:

A. Responsibility: The Contractor shall do all cutting, patching and restoration required by its work, unless otherwise particularly specified in the Specifications.

B. Restore Work: The Contractor shall restore any work damaged during the performance of the work.

C. Competent Workers: All restoration work shall be done to the satisfaction of the Commissioner by competent workers skilled in the trade required by such restoration. If, in the judgment of the Commissioner, workers engaged in restoration work are incompetent, they shall be replaced immediately by competent workers.

D. Structural Elements: Do not cut and patch structural elements without the prior approval, in writing, of the Resident Engineer.

E. Operational Elements: Do not cut and patch operating elements and related components.

F. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Commissioner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

G. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

H. Removals: The Contractor must remove from the premises all demolished materials of every nature or description resulting from cutting, patching and restoration work, in accordance with the requirements hereinafter stipulated under Sub-Section 3.17 herein and as further required in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.15

3.15 LOCATION OF PARTITIONS:

A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor shall immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Resident Engineer.

3.16 FURNITURE AND EQUIPMENT:

A. Responsibility: The Contractor is responsible for moving all loose furniture and/or equipment in all areas where the location of such furniture and/or equipment interferes with the proper performance of its work.

B. Protection: All such furniture and/or equipment must be adequately protected with dust cloths and returned to their original locations when directed to do so by the Resident Engineer.

3.17 REMOVAL OF RUBBISH AND SURPLUS MATERIALS:

A. Of the waste that is generated during demolition, as many of the waste materials as economically feasible, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Rubbish: Rubbish shall not be thrown from the windows or other parts of the project. Mason's rubbish, dirt and other dust-producing material shall be wetted down periodically.

C. Location: The Contractor shall clean Project site and work area daily and sweep up and deposit, at a location designated on each floor, all of its rubbish, debris and waste materials, as it accumulates and when directed by the Resident Engineer. Wood crating shall be broken up, neatly bundled, tied and stacked ready for removal and be deposited at a location designated on each floor.
   1. Comply with requirements in NYC Fire Department for removal of combustible waste materials and debris.
   2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 degrees F (27 degrees C).
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

D. Laborers: The Contractor shall be responsible for the removal of all rubbish, etc., from the site. The Contractor shall remove from the designated locations all piles of rubbish, debris, waste material and wood crating as they accumulate and when directed by the Resident Engineer, and shall remove them from the site. The Contractor shall employ and keep engaged for this purpose an adequate number of laborers.

E. Surplus Materials: The Contractor shall remove from the site all surplus materials when there is no further use for same.

F. Tools And Materials: At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly removed.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

3.18 CLEANING:

A. The Contractor shall thoroughly clean all equipment and materials furnished and installed and shall deliver such materials and equipment undamaged in a clean and new appearing condition up to date of Final Acceptance.

B. Site: Maintain Project site free of waste materials and debris.

C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration up to date of Final Acceptance.

F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration up to date of Final Acceptance.

3.19 SECURITY AND PROTECTION OF WORK SITE:

A. Provide protection of installed work, including appropriate protective coverings and maintain conditions that ensure installed Work is without damage or deterioration up to date of Final Acceptance.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Secure and protect work and work site against damage, loss, injury, theft and/or vandalism.

D. Maintain daily sign-in sheets of workers and visitors and make the sheets available to the Commissioner

3.20 MAINTENANCE OF SITE AND ADJOINING PROPERTY:

A. The Contractor shall take over and maintain the Project site, after order to start work.

B. The Contractor shall be responsible for the safety of the adjoining property, including sidewalks, paving, fences, sewers, water, gas, electric and other mains, pipes and conduits etc. until the date of Final Acceptance. The Contractor shall, at its own expense, except as otherwise specified, protect same and maintain them in at least as good a condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants shall be kept clear at all times, maintained and repaired to serviceable condition with materials to match existing.

D. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.

E. The Contractor shall also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

3.21 MAINTENANCE OF PROJECT SITE:

A. The Contractor shall take over and maintain all project areas, after order to start work.

B. Until the date of Final Acceptance, the Contractor shall be responsible for the safety of all project areas, including water, gas, electric and other mains and pipes and conduits and shall at the Contractor's own expense, except as otherwise specified, protect same and maintain them in at least as good condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants shall be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.

D. The Contractor shall keep the space for the Resident Engineer in a clean condition.

3.22 SAFETY PRECAUTIONS FOR CONTROL CIRCUITS:

A. Control circuits, the failure of which will cause a hazard to life and property, shall comply with the New York City Dept. of Buildings, Bureau of Electrical Control requirements.

3.23 OBSTRUCTIONS IN DRAINAGE LINES:

A. The Contractor shall be responsible for all obstructions occurring in all drainage lines, fittings and fixtures after the installations and cleaning of these drainage lines, fittings and fixtures as certified by the Resident Engineer. Roof drains shall be kept clear of any and all debris. Any stoppage shall be repaired immediately at the expense of the Contractor.

END OF SECTION 01 73 00

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and procedural requirements for the management and disposal of construction waste and includes the following requirements:
   1. Waste Management Goals
   2. Waste Management Plan
   3. Progress Reports
   4. Progress Meetings
   5. Management Plan Implementation

B. This Section includes:
   1. Definitions
   2. Waste Management Performance Requirements
   3. Reference Resources
   4. Submittals
   5. Quality Assurance
   6. Waste Plan Implementation
   7. Additional Demolition and Salvage Requirements
   8. Disposal

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 73 00 EXECUTION
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONSTRUCTION RECORD DOCUMENTS
G. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.

D. Construction and Demolition Waste: Solid wastes typically including building materials, trash debris and rubble resulting from remodeling, repair and demolition operations. Hazardous materials and land clearing waste are not included.

E. Diversion from Landfill: To remove, or have removed, from the site for recycling, reuse or salvage, material that might otherwise be sent to a landfill.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.

G. Recycle (recycling): To sort, separate, process, treat or reconstitute solid waste and other discarded materials for the purpose of redirecting such materials into the manufacture of useful products. Recycling does not include burning, incinerating or thermally destroying waste.

H. Return: To give back reusable items or unused products to vendors.

I. Reuse: To reuse excess or discarded construction material in some manner on the Project site.

J. Salvage: To remove a waste material from the Project site for resale or reuse.

K. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable and reusable material.

L. Waste Management Plan: A project-related plan for the collection, transportation and disposal of waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material becoming landfill.

1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:

A. The City of New York has established that this project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, inaccurate planning, breakage, mishandling, contamination, or other factors shall be employed.

B. Of the waste that is generated during demolition, as many of the waste materials as economically feasible, and as stated here, shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.5 C

C. LEED CERTIFICATION: The City of New York will seek LEED (Leadership in Energy and Environmental Design) certification for this Project as indicated in the Addendum to the General Conditions from the U.S. Green Building Council. The documentation required here will be used for this purpose. LEED awards points for a variety of sustainable design measures on a project, one of which is the reuse and recycling of project waste.

D. DIVERSION REQUIREMENTS. A minimum of 75% of total Project demolition waste (by weight) shall be diverted from landfill. The following waste categories are likely candidates to be included in the diversion plan as applicable for this project:
   1. Concrete
   2. Bricks
   3. Concrete masonry units (CMU)
   4. Asphalt
   5. Metals (e.g. banding, stud trim, ceiling grid, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, brass, bronze)

6. Clean dimensional wood
7. Carpet and pad
8. Drywall
9. Ceiling tiles
10. Cardboard, paper and packaging
11. Reuse items indicated on the Drawings and/or elsewhere in the Specification

E. All fluorescent lamps, HID lamps and mercury-containing thermostats removed from the site shall be recycled.

F. Recycling on the job, subject to the Commissioner's approval, is encouraged on the site itself, such as the crushing and reuse of removed sound concrete and stone. Include these categories in the Waste Management Plan.

1.6 REFERENCES, RESOURCES:

A. DDC encourages its contractors to seek information from websites and experts in salvage or recycling in order to minimize disposal costs. There are numerous opportunities to sell, salvage, or to donate materials and accrue tax benefits (which would accrue to the contractor); also there are outlets that will pick up, and in some cases buy recyclable materials. Examples of information resources are as follows:

1. DDC's Sustainable Design web site: http://www.nyc.gov/html/ddc/html/design/sustainable_home.shtml This includes a manual on Construction and Demolition Waste Reduction and Recycling, a Sample Waste Management Plan and sample C&D Waste Management log. A standard Construction and Demolition Waste Management Log form is included at the end of this section.
2. Web Resources

(Information only; no warranty or endorsement is implied.)

www.wastematch.org Site of New York Waste Match, a materials exchange database and service

www.bignyc.org Site of Build It Green NYC, a non profit outlet for salvaged and surplus building materials

www.usgbc.org Site of the United States Green Building Council, with a description of the LEED certification process and requirements for C&D waste recycling

www.epa.gov/epawaste/index.htm Site of the U.S. Environmental Protection Agency that discusses construction and demolition waste issues, and links to other resources.

1.7 SUBMITTALS:

A. The Contractor shall be responsible for the development and implementation of a Waste Management Plan for the Project. The Contractor's subcontractors shall assist in the development of that Plan, and collect and deposit their waste and recyclable materials in accordance with the approved Plan.

B. DRAFT WASTE MANAGEMENT PLAN. Within fifteen (15) days after receipt of 'Notice to Proceed', or prior to any waste removal, whichever occurs sooner, the Contractor shall submit to the Commissioner a Draft Waste Management Plan. Include separate sections for demolition and construction waste. The Plan shall demonstrate how the performance goals will be met, and contain the following:

1. List of materials targeted for reuse, salvage, or recycling, and names, addresses, and phone numbers of receiving facilities/companies that will be purchasing or accepting each material.
2. Description of onsite and/or offsite sorting methods for all materials to be removed from site.
3. If mixed construction and demolition waste is to be sorted off-site, provide a letter from the processor stating the average percentage of mixed construction and demolition waste they recycle.
4. Landfill information: Names of landfills where non-recyclable/reusable/salvageable waste will be disposed, and list of applicable tipping fees.
5. Materials handling procedures: A description of the means by which any recyclable, salvaged, or reused materials will be protected from contamination, and collected in a manner that will meet the requirements for acceptance by the designated recycling processors.
6. Transportation: A description of the means of transportation and destination for recycled materials.
7. Meetings: Description of regular meetings to be held to address waste management.
8. Sample spreadsheet and description of how the implementation of the plan will be documented on a monthly basis.

C. FINAL WASTE MANAGEMENT PLAN. Within fifteen (15) days of Commissioner's approval of the Draft Plan, the Contractor shall submit a Final Waste Management Plan.

D. PROGRESS REPORTS. The Contractor shall submit monthly a Waste Management Progress Report, containing the following information:

1. Project title, name of company completing report, and dates of period covered by the report
2. Report on the disposal of all jobsite waste. A DDC C&D Waste Management Log form is available on the DDC Sustainable Design website and included at the end of this section. For each shipment of material removed from the site, provide the following:
   a. Date and ticket number of removal
   b. Identity of material hauler
   c. Material Category
   d. Total quantity of waste, in tones/cubic yards, by type
   e. Quantity of waste salvaged, recycled and/or reused, by type
   f. Total quantity of waste diverted from landfill (recycled, salvaged, reused) as a percentage of total waste
   g. Recipient of each material type
3. Provide monthly and cumulative project totals of waste, quantity diverted, and percentage diverted.
4. Note that the unit of measure may be either tons or cubic yards, but must be consistent for all shipments and all materials throughout the project. Reports with inconsistent or mixed units will not be reviewed and will be returned for re-submission.
5. Include legible copies of on-site logs, weight tickets and receipts. Receipts shall be from charitable organizations, recycling and/or disposal site operators who can legally accept the materials for the purpose of reuse, recycling or disposal. Contractor shall save such original documents for the life of the project plus seven (7) years.

E. LEED Submittal: For LEED designated projects submit LEED Letter Template for Credit 2.2, signed by the Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

F. Refrigerant Recovery. Submit Qualification data for Refrigerant recovery technician. Statement of refrigerant recovery, signed by the refrigerant recovery technician responsible for recovering refrigerant

stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.8 QUALITY ASSURANCE:

A. The Contractor shall designate a Waste Management Coordinator, to ensure compliance with this section. Coordinator shall be present at Project site full time for the duration of the project.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste management plans, documentation and implementation shall be discussed at the following meetings:

1. Pre-demolition kick-off meeting
2. Pre-construction kick-off meeting
3. Regular job-site meetings
4. Contractor toolbox meetings

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 WASTE PLAN IMPLEMENTATION:

A. The Contractor shall implement the Waste Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction Waste Management Representative, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation.

B. The Contractor shall be responsible for the provision of containers and the removal of all waste, non-returned surplus materials, and rubbish from the site in accordance with the approved Waste Management Plan. The Contractor shall oversee and document the results of the Plan. Monies received for salvaged materials shall remain with the Contractor, except the monies for those items specifically identified elsewhere in the specifications, or indicated on the drawings as belonging to others.

C. Responsibilities of Subcontractors: Each subcontractor shall be responsible for collecting its waste, non-returned surplus materials, and rubbish, in accordance with the Waste Management Plan.

D. Distribution. The Contractor shall distribute copies of the Waste Management Plan to each Subcontractor, Resident Engineer, Construction Manager, and Commissioner.

E. Instruction: The Contractor shall provide on-site instruction of proper waste management procedures to be used by all parties in appropriate stages of the Project.

F. Procedures. Conduct waste management operations to ensure minimum interference with site vegetation, roads, streets, walks and other adjacent occupied and used facilities.

1. Collect co-mingled waste and/or separate all recyclable waste in accordance with the Plan Specific areas on the Project site are to be designated, and appropriate containers and bins clearly marked with acceptable and unacceptable materials.
2. Inspect containers and bins for contamination and remove contaminated materials if found.

3. Comply with the General Conditions for controlling dust and dirt, environmental protection, and noise control.

3.2 ADDITIONAL DEMOLITION AND SALVAGE REQUIREMENTS:

A. Demolition and salvage of additional items indicated in other sections of the Project Specifications require special attention as part of the overall 75 % diversion from landfill. Specific requirements for special attention are designated in other sections of the Project Specifications.

3.3 DISPOSAL:

A. General. Except for items or material to be salvaged, recycled or otherwise reused, remove waste material from the Project site and legally dispose of them in a manner acceptable to authorities having jurisdiction.
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning. Do not burn waste materials

C. Disposal. Transport waste materials off Project Site and legally dispose of them.

END OF SECTION 01 74 19

NEW YORK CITY DEPARTMENT OF DESIGN + CONSTRUCTION

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

Project Name: _____
Project I.D.: _____

Contractor: _____
Prepared by: _____
For Month: _____

Haul Date	Ticket #	Hauling Company	*Material Category[2]	Material Quantity (tons or cubic yards)[1]				*Material Recipient
				*Total Weight	Excluded Material[3]	*Diverted Material[4]	*Landfilled Material	
				*Total		*Diverted	*Landfilled	
			Monthly Totals					
			% Diverted this Month*					
			Cumulative Totals					
			% Diverted to Date					

Notes:
1. Volume (cubic yards) may be used instead of weight if used for ALL amounts and ALL materials.
2. Includes concrete; bricks; concrete masonry units (CMU); asphalt; metals; clean dimensional wood; carpet and pad; drywall; ceiling tiles; cardboard, paper, and packaging; and any other reuse items indicated on the Drawings and/or elsewhere in the Specification.
3. Excluded material includes soil or land clearing debris.
4. Diverted material includes recycled and reused material diverted from landfill. Recycled material is reprocessed into new products. Reused material is reclaimed, salvaged or otherwise used in its original form, either on-site or off-site.

* These items must be listed in order to receive LEED credit.

NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

No Text

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Closeout Procedures, including without limitation the following:

1. Definitions
2. Substantial Completion
3. Final Acceptance
4. Warranties
5. Final Cleaning
6. Repair of the Work

B. LEED: Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13, "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS."

C. COMMISSIONING: Refer to the Addendum to identify whether this project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS. The Contractor shall cooperate with the commissioning agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or

combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Substantial Completion: shall mean the written determination by the Commissioner that the Work required under the Contract is substantially, but not entirely, complete.

D. Final Acceptance: shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

1.5 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, the Contractor shall complete and supply all items required by the contract specifications, General Conditions, Addendum to the General Conditions, change orders or other directives from the Commissioner's representatives. The required items will include all contract requirements for substantial completion, including but not limited to items related to releases, regulatory approvals, warranties and guarantees, record documents, testing, demonstration and orientation, final clean up and repairs, and all specific checklist of items by the Resident Engineer. (See Attachment "A" at the end of this section for sample requirements for Substantial Completion).

B. Prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the work is not complete.

C. Inspection: The Contractor shall submit to the Resident Engineer a written request for inspection for Substantial Completion. Within ten (10) days of receipt of the request, the Resident Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, Client Agency Representative and/or other entities having involvement with the Work to assist in the inspection of the Work .If the Resident Engineer makes a determination that the work is substantially complete and approves the Final Punch List and the date for Final Acceptance, he/she will so advise the Commissioner and recommend issuance of the Certificate of Substantial Completion. If the Resident Engineer determines that the work is not substantially complete, he/she will notify the Contractor of those items that must be completed or corrected before the Certificate of Substantial Completion will be issued.

1 Re-inspection: Contractor shall request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2 Results of completed inspection will form the basis of requirements for Final Acceptance.

1.6 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for Final Acceptance of the Work, the Contractor shall complete the following. (Note that the following are to be completed, submitted as appropriate, and approved by the Commissioner, as applicable, prior to the final inspection and are not to be submitted for approval or otherwise at the final inspection unless specifically indicated). List exceptions in the request.

1. Verify that all required submittals have been provided to the Commissioner including but not limited to the following:
   a. Manufacturer's cleaning instructions
   b. Posted instructions
   c. As-built Record Documents (Drawings, specifications, and product data) as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, incorporating any changes required by the Commissioner as a result of the review of the submission prior to the pre-final inspection.
   d. Operation and Maintenance Manuals, including Preventive Maintenance, Special Tools, Repair Requirements, Parts List, Spare Parts List, and Operating Instructions.

e. Completion of required Demonstration and Orientation, as applicable, of designated personnel in operation and maintenance of systems, sub-systems and equipment.
f. Applicable LEED Building submittals as described in Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.
g. Construction progress photographs as described in Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION.

2. Submit a certified copy of the final approved Punch List of items to be completed or corrected. The certified copy of the Punch List shall state that each item has been completed or otherwise resolved for acceptance, and shall be endorsed and dated by the Contractor.
3. Submit pest-control final inspection report and survey as required in Section 01 50 00, TEMPORARY FACILITIES AND CONTROLS.
4. Submit record documents and similar final record information.
5. Deliver tools, spare parts, extra stock and similar items.
6. Complete final clean-up requirements including touch-up painting of marred surfaces.
7. Submit final meter readings for utilities, as applicable, a measured record of stored fuel, and similar data as of the date when the City took possession of and assumed responsibility for corresponding elements of the work.

B. Final Inspection: The Contractor shall submit to the Resident Engineer a written request for inspection for Final Acceptance of the Work. Within ten (10) days of receipt of the request, the Resident Engineer will either proceed with inspection or notify the Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, Client Agency Representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further work remains to be done, he/she will so advise the Commissioner and recommend the issuance of the determination of Final Acceptance. If the Resident Engineer determines that the work is not complete, he/she will notify the Contractor of those items that must be completed or corrected before the determination of Final Acceptance will be issued.

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

1.7 WARRANTIES:

A. The items of materials and/or equipment for which manufacturer warranties are required are listed in Schedule B of the Addendum. For each item of material and/or equipment listed in Schedule B, the Contractor shall obtain a written warranty from the manufacturer. Such warranty shall provide that the material or equipment is free from defects for the period set forth in Schedule B and will be replaced or repaired within such specified period. The contractor shall deliver all required warranties to the Commissioner.

B. Unless indicated otherwise Warranties are to take effect on the date of Substantial Completion.

C. Submittal Time: Submit written Warranties on request of the Commissioner for designated portions of the Work where commencement of Warranties other than date of Substantial Completion is indicated.

D. Partial Occupancy: Submit properly executed Warranties to the Commissioner within 15 days of completion of designated portions of the Work that are completed and occupied or used by the City.

E. Organize the Warranty documents into an orderly sequence based on the Project Specification Divisions and Section Numbers.

1. Bind Warranties in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES;" name and location of Project; Capitol Budget Project Number (FMS ID); and Contractor's and applicable subcontractor's name and address.
3. Provide heavy paper dividers with plastic-covered tabs for each separate Warranty. Mark tab to identify the product or installation.
4. Provide a typed description of each product or installation being warranted, including the name of the product, and the name, address, and telephone number of the Installer.

F. When warranted materials and/or equipment require operation and maintenance manuals, provide additional copies of each required Warranty in each required manual. Refer to Section 01 78 39, CONTRACT RECORD DOCUMENTS, for requirements of Operation and Maintenance Manuals.

PART II – PRODUCTS

2.1 MATERIALS:

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART III – EXECUTION

3.1 FINAL CLEANING:

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations, as applicable, before requesting inspection for Final Acceptance of the Work for entire Project or for a portion of Project:
      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
      d. Remove tools, construction equipment, machinery, and surplus material from Project site.
      e. Remove snow and ice to provide safe access to building.
      f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
      g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
      h. Sweep concrete floors broom clean in unoccupied spaces.
      i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Replace parts subject to unusual operating conditions.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

q. Clean ducts, blowers, and coils if units were operated without filters during construction.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

t. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests, as required in Section 01 50 00, TEMPORARY FACILITIES,SERVICES AND CONTROLS. Prepare and submit a Pest Control report to the Commissioner.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on City's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 REPAIR OF THE WORK:

A. Subject to the terms of the Contract the Contractor shall complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Contractor shall repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
   a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 77 00

ATTACHMENT 'A'

The following list is a general sample of Substantial Completion requirements, including but not limited to:

1. Prepare and submit a list to the Resident Engineer, of incomplete items, the value of incomplete construction, and reasons the work is not complete.
2. Obtain and submit any necessary releases enabling the City unrestricted use of the project and access to services and utilities.
3. Regulatory Approvals: Submit all required documentation from applicable Governing Authorities, including, but not limited to, Department of Buildings (DoB); Department of Transportation (DoT); Department of Environmental Protection (DEP); Fire Department (FDNY); etc. Documentation to include, but not limited to, the following:
   a. Building Permits, Applications and Sign-offs.
   b. Permits and Sign-off for construction fences; sidewalk bridges; scaffolds, cranes and derricks; utilities; etc.
   c. Certificates of Inspections and Sign-offs.
   d. Required Certificates and Use Permits.
   e. Certificate of Occupancy (C.O.), Temporary Certificate of Occupancy (T.C.O.) or Letter of Completion as applicable.
4. Submit specific warranties required by the specifications, final certifications, and similar documents.
5. Prepare and submit Record Documents as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, including but not limited to; approved documentation from Governing Authorities; as-built record drawings and specifications; product data; operation and maintenance manuals; Final Completion construction photographs; damage or settlement surveys; final property surveys; and similar final record information. The Resident Engineer will review the submission and provide appropriate comments. If comments are significant the initial submission will be returned to the Contractor for correction and re-submission incorporating the comments prior to the Final Inspection.
6. Record Waste Management Progress Report: Submit C&D Waste Management logs, with legible copies of weight tickets and receipts required in accordance with Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
7. If applicable submit LEED Letter Template in accordance with the requirements of Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.
8. Schedule applicable Demonstration and Orientation required in other Sections of the Project Specifications and as described in Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.
9. Deliver tools, spare parts, extra materials, and similar items to location designated by Resident Engineer. Label with manufacturer's name and model number where applicable.
10. Make final changeover of permanent locks and deliver keys to the Resident Engineer. Advise Commissioner of changeover in security provisions.
11. Complete startup testing of systems as applicable.
12. Submit approved test/adjust/balance records.
13. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements as directed by the Resident Engineer.
14. If applicable complete Commissioning requirements as defined in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

No Text

SECTION 01 78 39
CONTRACT RECORD DOCUMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Contract Record Documents, including:
   1. As-built Contract Record Drawings.
   2. As-built marked-up copies of Record Specifications, addenda and Change Orders.
   3. As-built marked-up Product Data
   4. Record Samples
   5. Construction Record Photographs
   6. Operating and Maintenance Manuals
   7. Final Site Survey
   8. Guarantees and Warranties
   9. Waste Disposal Documentation
   10. LEED Materials and Matrix
   11. Miscellaneous Record Submittals

B. The Department of Design and Construction, at the start of construction (kick-off meeting), will furnish to the Contractor at no cost a complete set of Contract Drawings Mylars (reproducible) pertaining to the work to be performed under the Contract. It is the responsibility of the Contractor to modify the Contract Drawings to indicate all changes and corrections, if any, occurring in the work as actually installed. The Contractor is required to furnish all other Mylar (reproducible) drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all work in detail as actually completed. All professional seals must be blocked out. Title box complete with project title and Design Consultants' names will remain.

C. Maintenance of Documents and Samples: The Contractor shall maintain, during the progress of the work, an accurate record of the work as actually installed, on Contract Record Drawings, on Mylar (reproducible), in ink. Store record documents and samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Resident Engineer's inspections.

   The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed work, so that the Contract Record Drawings contain this information in exact detail and location. Contract Record Drawings shall also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

   For projects designated to achieve a LEED rating the Contractor shall receive a copy of the project's LEED scorecard for the purpose of monitoring compliance with the target objectives and to facilitate coordination with the LEED Consultant. The Contractor shall receive periodic updates of this scorecard,

and is required to submit the final version of the Scorecard at Substantial Completion with other project Record Documents.

1.3 RELATED SECTIONS: include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
C.	Section 01 32 33	PHOTOGRAPHIC DOCUMENTATION
D.	Section 01 33 00	SUBMITTAL PROCEDURES
E.	Section 01 77 00	PROJECT CLOSEOUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. As-Built Contract Record Drawings: Comply with the following:

1. Progress Submission: As directed by the Resident Engineer, submit progress As-Built Contract Record Drawings at the 50% Construction Completion stage.

2. Final Submission: Before substantial completion payment, the Contractor shall furnish to the Commissioner one (I) 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 (I/2) inch high, and contain the following data:

AS-BUILT CONTRACT RECORD DRAWING
Contractor's Name _____
Contractor's Address _____
Subcontractor's Name (where applicable) _____
Subcontractor's Address _____
Made by: Date _____
Checked by: Date _____

Commissioner's Representatives
(Resident Engineer) DDC
(Plumbing Inspector) DDC
(Heating & Ventilating Inspector) DDC
(Electrical Inspector) DDC

5. Record Drawing Title Sheet: The Contractor shall prepare a title sheet, the same size as the Contract Record Drawings, which shall contain the following:

    a. Heading:
    The City of New York
    Department of Design and Construction
    Division of Public Buildings
    b. Capital Budget Project Number (FMS ID)
    c. Name and Location of Project
    d. Contractor's Name and Address
    e. Subcontractor's Name and Address (where applicable)
    f.. Record of changes (a caption description of work affected, and the date and number of Change Order or other authorization)
    g.. List of Record Drawings

B. Record Specifications, Addenda and Change Order: Submit to the Commissioner two (2) copies each of marked-up Record Specifications, Addenda and Change Orders.

C. Record Product Data: Submit to the Commissioner two (2) sets of Record Product Data.

D. Record Construction Photographs: Submit to the Commissioner final as-built construction photographs and negatives of the completed work as described in Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION.

E. Operating and Maintenance Manuals:

1. Submit three (3) copies each of preliminary manuals to the Resident Engineer for review and approval. The Contractor shall make such corrections, changes and/or additions to the manual until deemed satisfactory by the Resident Engineer. Deliver three (3) copies of the final approved manuals to the Resident Engineer for distribution.

2. Commissioning: Comply with the requirements of Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS, as well as the requirements set forth in sections of the Project Specifications, for projects designated for Commissioning. Submit four (4) copies each of data designated to be included in the Commissioning Operation and Maintenance Manual to the Resident Engineer. The Resident Engineer will forward such data to the Commissioning Authority/Agent (CxA) for review and comment. The Contractor shall make such corrections, changes and/or additions to the data until deemed satisfactory and deliver four (4) copies of the final data to the Resident Engineer for use by the Commissioning Authority/Agent (CxA) to prepare the Commissioning Operation and Maintenance Manual.

    a. Non-Commissioning Data: All remaining data not designated for Commissioning and required as part of Maintenance and Operation Manual shall be prepared and assembled in accordance with the requirements of this section for Operating and Maintenance Manuals.

F. Final Site Survey: Submit Final Site Survey as described in Section 01 73 00, EXECUTION, in quantities requested by the Commissioner, signed and sealed by a Land Surveyor licensed in the State of New York.

G. Guarantees and Warranties.

H. Waste Disposal Documents and Miscellaneous Record Documents.

PART II – PRODUCTS

2.1 CONTRACT RECORD DRAWINGS:

A. Record Prints: The Contractor shall maintain one set of blue- or black-line white prints as applicable of the Contract Drawings and Shop Drawings. If applicable, the Record Contract Drawings and Shop Drawings shall incorporate the arrangement of the work based on the accepted Master Coordination Drawing(s) as described in Section 01 33 00, SUBMITTAL PROCEDURES.

1. Preparation: The Contractor shall mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an understandable drawing technique.
   c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Change Orders: All changes from Contract Drawings shall be distinctly encircled and identified by Change Order number correlating to changes listed on the "Title Sheet." The Contractor shall show within the encircled areas the work as actually installed.

B. Content: Types of items requiring marking include, but are not limited to, the following:

1. Dimensional changes to Drawings.
2. Revisions to details shown on Drawings.
3. Depths of foundations below first floor.
4. Locations and depths of underground utilities.
5. Revisions to routing of piping and conduits.
6. Revisions to electrical circuitry.
7. Actual equipment locations.
8. Duct size and routing.
9. Locations of concealed internal utilities.
10. Changes made by Change Order
11. Changes made following Commissioner's written orders.
12. Details not on the original Contract Drawings.
13. Field records for variable and concealed conditions.
14. Record information on the Work that is shown only schematically.

C. Progress Record Mylar's (reproducible): As directed by the Resident Engineer at 50% construction completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When directed by the Resident Engineer transfer progress mark-ups to a full set of Mylar's (reproducible) and submit one blue line or black line record copy to the Resident Engineer. The marked-up Mylar's (reproducible) shall be retained by the contractor for completion of mark-up and final submission.

D. Final Contract Record Mylar's (reproducible): Immediately before final inspection for Certificate of Substantial Completion, review marked-up Record Prints with the Resident Engineer and the Design Consulting. When authorized, complete mark-up of a full set of corrected Mylar's (reproducible) of the Contract Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Resident Engineer for resolution.
3. Print the As-Built Contract Drawings and Shop Drawings for use as Record Transparencies as described in Sub-Section 1.5.

2.2 RECORD SPECIFICATIONS, ADDENDA AND CHANGE ORDERS:

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders and Record Drawings where applicable.
6. Upon completion of mark-up, submit two (2) complete copies of the marked-up Record Specifications to the Commissioner.

2.3 RECORD PRODUCT DATA:

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. If possible, a Change Order proposal should include resubmitting updated Product Data. This eliminates the need to mark up the previous submittal.
4. Note related Change Orders and Record Drawings where applicable.
5. Upon completion of mark-up submit to the Commissioner two (2) sets of the marked-up Record Product Data.
6. Where Record Product Data is required as part of Maintenance Manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

2.4 RECORD SAMPLE SUBMITTAL:

A. Prior to the date of Substantial Completion, the Contractor shall meet with the Resident Engineer at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Commissioner for record purposes.

B. Comply with the Resident Engineer's instructions for packaging, identification marking and delivery to DDC. Dispose of other samples as specified for disposal of surplus and waste material.

2.5 OPERATING AND MAINTENANCE MANUALS:

A. The Contractor shall provide preliminary and final versions of Operating and Maintenance Manuals required for those systems, equipment and materials listed in other Sections of the Project Specifications.

B. Format: Prepare and assemble Operation and Maintenance Manuals in heavy-duty, 3-ring, hardback loose leaf binders in the form of an instructional manual. All binders for each discipline shall be the same color. When multiple binders are used, correlate data into related consistent groupings. Binder front shall containing permanently attached labels displaying the following:

1. Heading:
   The City of New York
   Department of Design and Construction
   Division of Public Buildings
2. Capital Budget Project Number (FMS ID)
3. Name and Location of Project
4. Contractor's name and Address
5. Subcontractor's Name and Address (where applicable)
6. Dates of the work covered by the contents of the Project Manual.
7. Binder spine shall display Project Number (FMS ID) and date of completion.

C. Organization: Include a section in the directory for each of the following:

1. List of documents
2. List of systems
3. List of equipment
4. Table of contents

D. Arrange content by systems under Specification Section numbers and sequence of Table of Contents of the Project manual. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.

E. Safety warnings or cautions shall be visibly highlighted within each maintenance procedure. Use of such highlights shall be limited to only critical items and shall not be used in an excessive manner which would reduce their effectiveness.

F. For each product or system, list names, addresses and telephone numbers of Subcontractors and Suppliers, including local source of supplies and replacement parts. Vendors and Supplier listings are to include names, addresses and telephone numbers, including nearest field service telephone numbers.

G. Where contents of the manual include any manufacturer's catalog pages, clearly indicate the precise items and options included in the installation and delete all manufacturers' data regarding products not included in the installation.

H. All material within manuals shall be new. Copies used for prior submittals or used in construction shall not be used.

I. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.

J. Manuals shall present all technical material to the greatest extent possible, with respect to text, tabular matter and illustrations. Illustrations shall preferably consist of line drawings. All applicable drawings shall be included. If available, color photograph prints may be included.

K. Preliminary manual editions shall be as technically complete as the final manual edition. All illustrations shall be in final forms.

L. Final manual editions shall be technically accurate and complete and shall represent all "as-built" systems, pieces of equipment, or materials, which have been accepted by the Commissioner. All illustrations, text and tabular material shall be in final form. All shop drawings shall be included as specified in individual Specification Sections.

M. Building products, applied materials, and finishes: Include product data, with catalog number, size, composition, and color texture designations. Where applicable, provide information for re-ordering custom manufactured products.

N. Instructions for care and maintenance: Include manufacturers' recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.

O. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical compositions, and details of installation. Provide recommendations for inspections, maintenance, and repair.

P. Additional Requirements: Specified in individual Specification Sections.

2.6 DEMONSTRATION AND ORIENTATION DVD:

A. Non-Commissioned Projects: The Contractor shall submit final version of applicable Demonstration and Training DVD recordings in compliance with Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

2.7 GUARANTEES AND WARRANTIES:

A. SCHEDULE B – Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.

B. FORM – For all guarantee requirements set forth in Schedule B, the Contractor shall provide a written guaranty, in the form set forth herein.

C. Submit fully executed and signed manufacturers' Warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.

GUARANTY

DDC PROJECT # _____

PROJECT DESCRIPTION _____

_____

CONTRACT # _____

SPECIFICATION SECTION # AND TITLE _____

_____

GUARANTY TO BE IN EFFECT FROM _____

TO _____

The Contractor hereby guarantees that the work specified under the above section of the aforesaid Contract will be free from defects of material and/or workmanship, for the period indicated above.

The Contractor also guarantees that it will promptly repair, restore, rebuild or replace whichever may be deemed necessary by the City, any or all defective material or workmanship of the aforementioned section, that may appear within the guaranty period and any finished work to which damage may occur because of such defects, to the satisfaction of the City and without any cost or expense to the City.

The Contractor hereby agrees to pay to the City the cost of the repairs or replacements should the City make the same because of the failure of the Contractor to do so.

Contractor: _____

By: _____
Signature of Partner or Corporate Officer

Print Name: _____

Subscribed and sworn to before me this
day of _____, year _____

_____
Notary Public

2.8 WASTE DISPOSAL DOCUMENTATION:

A. Certify and deliver to the Commissioner all documentation including reports, receipts, certificates, records etc. for the collection, handling, storage, classification, testing, transportation, recycling and/or disposal of all Non-Hazardous Construction Waste as required by Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, and Hazardous Waste as required by other Project Specification Sections. Certify compliance with all applicable governing laws, codes, rules and regulations.

2.9 MISCELLANEOUS RECORD DOCUMENTS:

A. Refer to other Project Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.

B. Submit three (3) copies of each document to the Commissioner or as otherwise directed by the Commissioner.

PART III – EXECUTION

3.1 RECORDING AND MAINTENANCE:

A. Recording: Maintain one copy of each submittal during the construction period for Contract Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to the Contract Record Documents for the Resident Engineer's reference during normal working hours.

END OF SECTION 01 79 39

No Text

SECTION 01 79 00
DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 79 00

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements, when set forth in sections of the Project Specifications, for instructing facility's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Owner's Pre-Acceptance Orientation in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and Orientation videotapes. (Non-Commissioned Projects)

B. The Contractor shall provide the services of equipment manufacturers orientation specialists experienced in the type of equipment to be demonstrated.

C. Separate Orientation sessions shall be conducted for mechanical operations and maintenance personnel and for electronic and electrical maintenance personnel.

D. Commissioning: Refer to the Addendum to identify whether this project is to be Commissioned. For Commissioned projects the Contractor shall provide Demonstration and Orientation as described in this section and cooperate with the Commissioning Authority/Agent (CxA) to implement Commissioning requirements as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 77 00 CLOSEOUT PROCEDURES
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS
F. Specific requirements for demonstration and training indicated in other sections of the Project Specifications

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. Instruction Program: Submit three (3) copies of outline of instructional program for demonstration and orientation, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each orientation module to the Commissioner for approval no less than thirty (30) days prior to the date the proposed orientation is to take place. Include learning objectives and outline for each orientation module.

1. At completion of training, submit three (3) complete training manual(s) and three (3) applicable DVD recording(s) to the Commissioner for the facility's and City's use.

B. Qualification Data: For facilitator, instructor and Videographer.

C. Attendance Record: For each orientation module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each orientation module, submit results and documentation of performance-based test.

E. Submit all final orientation material to the Resident Engineer a minimum of fourteen (14) days prior to the scheduled training.

F. Demonstration and Orientation Recordings:

1. Non-Commissioned Projects:

a. The Contractor shall submit to the Commissioner three (3) copies of Demonstration and Orientation DVD (Digital Video Disk) recordings within seven (7) days of end of each training module.

b. Identification: On each copy, provide an applied label with the following information:

1) Project Contract I.D. Number
2) Project Contract Name
3) Name of Contractor
4) Name of Subcontractor as applicable
5) Name of Design Consultant
6) Name of Construction Manager as applicable
7) Date recorded.
8) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
9) Table of Contents including list of systems covered.

c. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD recording. Include name of Project and date of recording on each page.

2. Commissioned Projects:

a. Demonstration and Orientation DVD recordings for Commissioned projects will be recorded by the Commissioning Authority/Agent (CxA) under separate contract with the City of New

York. The Contractor performing Demonstration and Orientation shall cooperate with the CxA in the recording of each Demonstration and Orientation module.

1.6 QUALITY ASSURANCE:

A. Facilitator Qualifications: A firm or individual experienced in orientation or educating maintenance personnel in an orientation program similar in content and extent to that indicated for this Project.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00, QUALITY REQUIREMENTS, experienced in operation and maintenance procedures and orientation.

C. Videographer Qualifications: A professional Videographer who has experience with orientation and construction projects.

D. Pre-instruction Conference: Schedule with the Resident Engineer a conference at Project site to comply with requirements in Section 01 31 00, PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and orientation including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.7 COORDINATION:

A. Coordinate instruction schedule with the Resident Engineer and facility's operations. Adjust schedule as required to minimize disrupting facility's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of orientation modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the Commissioner.

PART II – PRODUCTS

2.1 INSTRUCTION PROGRAM:

A. Program Structure: Develop an instruction program that includes individual orientation modules for each system and equipment not part of a system, as specified and required by individual Specification Sections.

B. Orientation Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.

d. Regulatory requirements.
e. Equipment function including auxiliary equipment and systems.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project Record Documents.
   e. Identification systems.
   f. Warranties

3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.

7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning

e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.
h. Housekeeping practices

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART III – EXECUTION

3.1 INSTRUCTION:

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and the Resident Engineer for the number of participants, instruction times, and location.

B. The Contractor shall engage qualified instructors to instruct facility's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

C. Scheduling: Schedule instruction with the Resident Engineer at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule orientation with the Resident Engineer with at least fourteen (14) days' advance notice.

D. Evaluation: At conclusion of each orientation module, assess and document each participant's mastery of module(s) by use of an oral a written or a demonstration performance-based test.

E. Cleanup: Collect and remove used and leftover educational materials from project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial orientation use.

3.2 DEMONSTRATION AND ORIENTATION RECORDINGS:

A. Non-Commissioned projects:
1. The Contractor shall engage a qualified commercial Videographer to record demonstration and orientation sessions. Record each orientation module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
2. At beginning of each orientation module, record each chart containing learning objective and lesson outline.
3. All recordings must be close captioned.
4. Recording Format: Provide high-quality DVD (Digital Video Disk) format.
5. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and orientation. Display continuous running time.
6. Narration: Describe scenes on the recording by audio narration by microphone while recording or by dubbing audio narration off-site after. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

7. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from opposite the corresponding narration segment.

B. Commissioned Projects:

Refer to the Addendum to determine if the project is to be Commissioned.

1. The Commissioning Authority/Agent (CxA) under separate contract with the City of New York will assess and comment on the adequacy of the Orientation Instruction sessions by reviewing the Orientation and Instruction program and agenda provided by each contractor. The provider of the Orientation program will videotape the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor shall edit the DVD recording per CxA comnents.

END OF SECTION 01 79 00

SECTION 01 81 13
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. LEED BUILDING - GENERAL REQUIREMENTS:

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor shall ensure that these requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the stated LEED BUILDING criteria.

B. This Section includes:

1. Definitions
2. LEED Provisions
3. LEED Building Submittals
4. LEED Building Submittal Requirements
5. LEED Action Plan

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
B.	Section 01 81 13.13	VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS
C.	Section 01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
D.	Section 01 91 13	GENERAL COMMISSIONING REQUIREMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Agrifiber Products: Products derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks, and agricultural prunings, processed and mixed with resins to produce panels with characteristics similar to composite wood.

C. Composite Wood: Products composed of wood or plant particles or fibers bonded by a synthetic resin or binder to produce panels such as plywood, particleboard, and medium density fiberboard (MDF). Does not include hardboard, structural panels, glued laminated timber, prefabricated wood I-joists, or finger-jointed lumber.

D. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

E. Forest Stewardship Council (FSC) Certified Wood: Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.

F. LEED: The Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council.

G. Rapidly Renewable Materials: Materials made from agricultural products that are typically harvested within a ten-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.

H. Regionally Manufactured Materials: Materials that are manufactured within a radius of 500 miles from the Project location. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.

I. Regionally Extracted, Harvested, or Recovered Materials: Materials which are extracted, harvested, or recovered and manufactured within a radius of 500 miles from the Project site.

J. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).
   1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.
   2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.
   3. "Pre-consumer" may also be referred to as "post-industrial".

K. Solar Reflectance Index (SRI): A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.

L. Volatile Organic Compound (VOC): Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.

1.5 LEED PROVISIONS:

A. Refer to the Addendum for the LEED rating to be achieved for this project. The provisions to achieve this LEED rating are integrated within the project construction documents and specifications. The Contractor is specifically directed to the "LEED BUILDING Performance Criteria" and "LEED BUILDING Submittals" sections within the contract specification. Additional LEED requirements are met through aspects of the project design, including material and equipment selections, which may not be specifically identified as LEED BUILDING requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.6 LEED BUILDING SUBMITTALS:

A. Scope: LEED BUILDING submittals are required for all installed materials included in General Construction work. LEED BUILDING Submittals are only required for field-applied adhesives, sealants, paints and coatings included in Plumbing, Mechanical and Electrical work. Submit all required LEED BUILDING submittals in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

B. Applicability: The extent of the LEED BUILDING Submittals varies depending on the specification section. Applicable LEED BUILDING Submittals are listed under the "LEED BUILDING Submittals" heading in each specification section. The detailed requirements for the LEED BUILDING Submittals are defined in Item C below.

C. Detailed Requirements: Sub-Sections 1.6 C.1through 1.6 C.3 below defines the information and documents to be provided for each type of LEED BUILDING Submittal as identified in the LEED Submittal Requirements of each specification section:

1. ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM (EBMCF)[GHI]: Information to be supplied for this form (blank sample copy attached at end of this Section to be modified as appropriate to the project) 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 x pre-consumer percentage x product value + 1 x post-consumer percentage x product value = total recycled content value).
      2. See additional requirements for concrete below.
   c. Identification (Yes/No) of materials manufactured within 500 miles of the project site AND containing raw materials harvested or extracted within 500 miles of the project site.
      1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
      2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the project site.
   d. Volatile Organic Compound (VOC) content of all field-applied adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
      1) For detailed requirements refer to Section 01 81 13.13 VOC LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.
   e. The amount of "Forest Stewardship Council (FSC) Certified" wood products if used in the Project.
      1) Record only new FSC-certified wood products. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.

2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.

f. The amount of Rapidly Renewable materials if used in the Project.
   1) Indicate the type of rapidly renewable material used, and the percentage by weight, relative to the total weight of the product, that consists of rapidly renewable material.

g. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
   1) For each concrete mix, provide a complete breakdown of all components, by weight and by cost.

h. Identification (Yes/No) of composite wood or agrifiber products used in the project that are free of added urea-added formaldehyde resins.

i. Identification (Yes/No) of flooring products used in the project that have Carpet and Rug Institute (CRI) Green Label or Green Label Plus certification, or Resilient Floor Covering Institute FloorScore certification.
   1) Untreated solid wood flooring, and mineral-based flooring products such as tile, masonry, terrazzo, and cut stone that have no organic-based coatings or sealants, are excluded from this requirement.

j. The EBMCF shall record the above information only for those materials or products permanently installed in the project. The EBMCF shall record VOC content, composite and agrifiber products, and CRI or FloorScore ratings only for those materials or products permanently installed within the weather barrier of the LEED building.

2. EBMCF BACK-UP DOCUMENTATION: These documents are used to validate the information provided on the EBMCF (except cost data). For each material listed on the EBMCF, provide documentation to certify the material's LEED BUILDING attributes, as applicable:

   a. RECYCLED CONTENT: Provide published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.

   b. REGIONAL MANUFACTURING **AND** REGIONAL RAW MATERIALS (WITHIN 500 MILES): Provide published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered and the distance in miles from the project site.
      1) If only some of the raw materials for a particular product or assembly originate within 500 miles of the project site, provide the percentage (by weight) that these materials comprise in the complete product.

   c. VOC CONTENT: Provide Material Safety Data Sheets (MSDS) certifying the Volatile Organic Compound (VOC) content of the adhesive, sealant, paint, or coating products. VOC content is to be reported in grams/liter or lbs./gallon, less water. If the MSDS does not show the product's VOC content, this information must be provided through other published product literature from the manufacturer, or stated in a letter of certification from the product manufacturer on the manufacturer's letterhead.

   d. RAPIDLY RENEWABLE MATERIALS: If used in the project, provide published literature or letter of certification on the manufacturer's letterhead certifying the percentage of each product that is rapidly renewable (by weight).

3. PRODUCT CUT SHEETS: Provide product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.

4. CRI GREEN LABEL PLUS CERTIFICATION: For carpets and carpet cushions, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the "Green Label Plus" IAQ testing program of the Carpet and Rug Institute of Dalton, GA.

5. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER RESINS: For all composite wood, engineered wood and agrifiber products (including plywood, particleboard, and medium density fiberboard), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that that the products do not contain added urea-formaldehyde resins.

6. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER LAMINATING ADHESIVES: For all laminating adhesives used with composite wood, engineered wood and agrifiber products (e.g., adhesives used to laminate wood veneers to an engineered wood substrate), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the adhesive products do not contain urea-formaldehyde.

7. FSC-CERTIFIED WOOD:
   a. If used in the project, provide chain of custody documents and copies of invoices regarding wood products, including whether or not such wood product is FSC-certified.
   b. If used in the project, for assemblies, provide the percentage (by cost and by weight) of the assembly that is FSC-certified wood.
   c. If used in the project, for assemblies, provide published product literature or letter from the manufacturer(on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.

8. GREEN SEAL COMPLIANCE: Provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the following product types comply with the VOC limits and chemical component restrictions developed by the Green Seal organization of Washington, DC:

   a. Interior Architectural Paints and Coatings: refer to Green Seal standard GS-11 (1st edition, May 1993)
   b. Anti-corrosive and Anti-rust paints: refer to Green Seal standard GC-03 (2nd Edition, January 1997)
   c. Aerosol Adhesives: refer to Green Seal standard GS-36 (1st edition, October 2000)

9. HIGH ALBEDO PAVING AND WALKWAY MATERIALS: For paving and walkway materials made from concrete or brick provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum Solar Reflectance Index (SRI) value of 29. SRI values 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 ≤ 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 PROCEEDURES.
    3. Detailed requirements: ESC Plan
        a. Include the Stormwater Pollution Prevention Plan, if required.
        b. Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.
        c. Describe all site work that will be implemented on the project.
        d. Provide site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, and inlet/catch basin protection.
        e. Describe the inspection and maintenance of the ESC measures. Provide a construction schedule indicating weekly site review.
        f. Describe reporting and documentation measures.
    4. Detailed requirements: ESC Measures

5. Submittal requirements: ESC Tracking Log
   a. Note date of major rain events, describe damage, describe any repairs or maintenance performed, and note responsible party.
   b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party.
   c. Submit monthly.
6. Implementation
   a. The Contractor 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

NEW YORK CITY DEPARTMENT OF DESIGN + CONSTRUCTION

ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM

Contractor Name: _____
Contractor Contact: _____
Telephone Number: _____

Project Name: _____
Project I.D.: _____

Product/Manufacturer	Material Cost[1]	Recycled Content			Regional[4]			Rapidly Renewable[7]		VOC content[8]		Flooring[9]	Wood	
		Pre-Consumer (% by wt)[2]	Post-Consumer (% by wt)[3]	Total % (½ Pre + Post)	Location & Distance to Extraction[5]	Location & Distance to Manufacture[6]	Extracted & Manuf. (% by wt)	Material	% by wt	*VOC content listed	*VOC content allowed	*Green Label or FloorScore	*Added urea formaldehyde (Yes/No) [10]	FSC Certified[11] (% by wt)

[1] **Material Cost:** As it appears on the manufacturer's or distributor's invoice to the contractor or subcontractor. Does not include labor or equipment costs associated with installation.

[2] **Pre-Consumer Recycled Content:** Industrial/manufacturing waste material (e.g., fly-ash and synthetic gypsum, both waste products from coal burning electricity plants) diverted from landfill and incorporated into a finished product. Scrap raw materials that can be reused in the same manufacturing process from which they are recovered are not considered Pre-Consumer Recycled Content.

[3] **Post-Consumer Recycled Content:** Material or product that has served its intended consumer use (e.g., an empty plastic bottle) and has been diverted from landfill and incorporated into a finished product.

[4] **Regional:** Refers to a material/product that is BOTH extracted AND manufactured within 500 miles of the Project site. Record this information ONLY for materials/products meeting BOTH of these criteria.

[5] **Extraction:** Refers to the location from which the raw resources used in a building product are extracted, harvested, or recovered.

[6] **Manufacture:** Refers to the location of the final assembly of components into a building product that is furnished and installed by the Contractor.

[7] **Rapidly Renewable:** Refers to materials/products derived from agricultural products that are typically harvested within a ten-year or shorter cycle.

[8] **VOC Content:** The quantity of volatile organic compounds contained in adhesives, sealants. paints and architectural coatings. Reported in grams/liter or lbs/gallon, less water.

[9] **Flooring:** For carpet, indicate Carpet and Rug Institute (CRI) Green Label Plus certification. For carpet cushion, indicate CRI Green Label certification. For all flooring except unfinished/untreated wood and mineral-based flooring (tile, masonry, terrazzo, cut stone) without organic-based coatings or sealants, indicate Resilient Floor Covering Institute FloorScore rating. VOC limits for adhesives, sealants, etc. still apply.

[10] **Added Urea Formaldehyde:** Applies to composite wood and agrifiber products only (plywood, particleboard, MDF, OSB, wheatboard, strawboard). Resins or binders with added urea formaldehyde are prohibited.

[11] **FSC Certified:** Certification from the Forest Stewardship Council. This column is only applicable to wood products.

* Applies only to materials/products installed within the weather barrier.

Contractor Certification:

I, _____ a duly authorized representative of _____ (the Contractor) hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by the Contractor as components of the final building construction. Furthermore, I understand that any change in such qualifications during the purchasing period will require prior written approval from the Commissioner.

Signature of Authorized Representative: _____ Date: _____

NO TEXT

SECTION 01 81 13.13
VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for the project.

B. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints and coatings shall follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications regarding adhesives, sealant or sealant applications, paints and coatings, the requirements set forth in this Section shall prevail.

C. This Section includes:

1. General Requirements
2. References
3. VOC Requirements for Interior Adhesives
4. VOC Requirements for Interior Sealants
5. VOC requirements for Interior Paints
6. VOC requirements for Interior Coatings
7. Submittals

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 33 00 SUBMITTAL PROCEDURES
E. Section 01 73 00 EXECUTION
F. Section 01 77 00 CLOSEOUT PROCEDURES
G. Section 01 78 39 CONTRACT RECORD DOCUMENTS
H. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS
I. Section 01 81 19 INDOOR AIR QUALITY FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. ADHESIVE: Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers.
   1. Aerosol Adhesive: Any adhesive packaged as an aerosol with a spray mechanism permanently housed in a non-refillable can designed for hand-held application without the need for ancillary equipment.

B. CARCINOGEN: A chemical listed as a known, probable, reasonably anticipated, or possible human

carcinogen by the International Agency for Research on Cancer (IARC) (Groups 1, 2A, and 2B), the National Toxicology Program (NTP) (Groups 1 and 2), the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) (weight-of-evidence classifications A, B1, B2, and C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or the Occupational Safety and Health Administration (OSHA).

C. CLEAR WOOD FINISH: Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film.
   1. Lacquer: Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film.
   2. Sanding Sealer: A sanding sealer that also meets the definition of a lacquer.
   3. Varnish: Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.

D. COATING: Liquid, liquefiable, or mastic composition that is converted to a solid adherent film after application to a substrate as a thin layer; and is used for decorating, protecting, identifying or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics; and is intended for on-site application to interior or exterior surfaces of buildings. Does not include stains, clear finishes, recycled latex paint, specialty (industrial, marine or automotive) coatings or paint sold in aerosol cans.

E. FLOOR COATING: Opaque coating applied to flooring. Excludes industrial maintenance coatings.

F. HAZARDOUS AIR POLLUTANT: Any compound listed by the U.S. EPA in the Clean Air Act Section 112(b)(1) as a hazardous air pollutant.

G. MUTAGEN: A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be 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).

H. OZONE-DEPLETING COMPOUNDS: A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.

I. PAINT: A pigmented coating. For the purposes of this specification, paint primers are considered to be paints.
   1. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter).
   2. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter).
   3. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter).
   4. Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.

J. PRIMER: Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the substrate; or to provide a smooth surface for application of a subsequent coating.

K. REPRODUCTIVE TOXIN: A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).

L. SANDING SEALER: Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).

M. SEALANT: Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints

between surfaces. Includes sealant primers and caulks.

N. SHELLAC: Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.

O. STAIN: Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.

P. VOLATILE AROMATIC COMPOUND: Any hydrocarbon compound containing one or more 6-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

B. Rule 1113 - "Architectural Coatings", amended 9 July 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11- "Paints", of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03- "Anti-Corrosive Paints", of Green Seal, Inc., Washington, DC, www.greenseal.org

1.6 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as "products") shall not be in excess of **250 grams per liter.**

B. No product shall contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioacculmulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception shall be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which shall be less than or equal to 1% by weight of the product.

C. No product shall contain the following:
   1. methylene chloride
   2. 1,1,1-trichloroethane
   3. benzene

4. toluene
5. ethylbenzene
6. vinyl chloride
7. naphthalene
8. 1,2-dichlorobenzene
9. di (2-ethylhexyl) phthalate
10. butyl benzyl phthalate
11. di-n-butyl phthalate
12. di-n-octyl phthalate
13. diethyl phthalate
14. dimethyl phthalate
15. isophorone
16. antimony
17. cadmium
18. hexavalent chromium
19. lead
20. mercury
21. formaldehyde
22. methyl ethyl ketone
23. methyl isobutyl ketone
24. acrolein
25. acrylonitrile

D. No product shall contain more than 1.0% by weight of sum total of volatile aromatic compounds.

1.8 VOC REQUIREMENTS FOR INTERIOR ADHESIVES:

A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers, or adhesive primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

C. For specified building construction related applications, the allowable VOC content is as follows:

1. Architectural Applications:

a.	Indoor carpet adhesive	50
b.	Carpet pad adhesive	50
c.	Wood flooring adhesive	100
d.	Rubber floor adhesive	60
e.	Subfloor adhesive	50
f.	Ceramic tile adhesive	65
g.	VCT and asphalt tile adhesive	50
h.	Drywall and panel adhesive	50
i.	Cove base adhesive	50
j.	Multipurpose construction adhesive	70
k.	Structural glazing adhesive	100

2. Specialty Applications:

a.	PVC welding	510
b.	CPVC welding	490
c.	ABS welding	325
d.	Plastic cement welding	250

e.	Adhesive primer for plastic	550
f.	Contact Adhesive	80
g.	Special Purpose Contact Adhesive	250
h.	Structural Wood Member Adhesive	140
i.	Sheet Applied Rubber Lining Operations	850
j.	Top and Trim Adhesive	250

3. Substrate Specific Applications:

a.	Metal to metal	30
b.	Plastic foams	50
c.	Porous material (except wood)	50
d.	Wood	30
e.	Fiberglass	80

4. Aerosol Adhesives:

a.	General purpose mist spray	65% VOC's by weight
b.	General purpose web spray	55% VOC's by weight
c.	Special purpose aerosol adhesives (all types)	70% VOC's by weight

1.9 VOC REQUIREMENTS FOR INTERIOR SEALANTS:

A. The volatile organic compound (VOC) content of sealants, or sealant primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1. Sealants:

a.	Architectural	250
b.	Non-membrane roof	300
c.	Roadway	250
d.	Single-ply roof membrane	450
e.	Other	420

2. Sealant Primer:

a.	Architectural – Nonporous	250
b.	Architectural – Porous	775
c.	Other	750

1.10 VOC REQUIREMENTS FOR INTERIOR PAINTS:

A. Paints and Primers: Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) shall meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

5. Volatile Organic Compounds:
   a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.

   Interior Paints and Primers:
   Non-flat: 150 g/l
   Flat: 50 g/l
   The calculation of VOC shall exclude water and tinting color added at the point of sale.

B. Anti- Corrosive and Anti-Rust Paints: Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates shall meet the VOC limitations of the Green Seal Paint Standard GC-03, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:
   1. Volatile Organic Compounds:
      a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.
      Anti-Corrosive and Anti-Rust Paints: 250 g/l

      The calculation of VOC shall exclude water and tinting color added at the point of sale.

1.11 VOC REQUIREMENTS FOR INTERIOR COATINGS:

A. Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to the interior shall meet the VOC limitations defined in Rule 1113, "Architectural Coatings" of SCAQMD, of the State of California. The VOC limits defined by SCAQMD, based on 7/9/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

1.	Clear Wood Finishes:	
	a. Varnish	350
	b. Sanding Sealers	350
	c. Lacquer	550
2.	Shellac:	
	a. Clear	730
	b. Pigmented	550
3.	Stains	250
4.	Floor Coatings	100
5.	Waterproofing Sealers	250
6.	Sanding Sealers	275
7.	Other Sealers	200

The calculation of VOC shall exclude water and tinting color added at the point of sale.

1.12 SUBMITTALS:

A. Submit Material Safety Data Sheets, for all applicable products in accordance with Section 01 33 00, SUBMITTAL PROCEDURES. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) limits of products submitted. (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

B. Submit Environmental Building Materials Certification Form (EBMCF) as referenced in Section 01 81 13 SUSTAINABLE REQUIREMENTS FOR LEED BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.13

SECTION 01 81 19
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:

A. The City of New York has determined that this Project shall minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, poor housekeeping, shall be minimized.

1.3 RELATED SECTIONS:

A. All sections of the Specifications related to interior construction, MEP systems, and items affecting indoor air quality.

B. Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

C. Section 01 81 13.13, VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.

D. Division 9 (of the Specifications): Finishes.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" shall mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives, composite wood binder, and foam insulations. Not all VOC's are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell and/or health impact.

D. Materials that act as "sinks" for VOC contamination: Absorptive materials, typically dry and soft materials (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOC's emitted by "source" materials and release them over a prolonged period of time.

E. Materials that act as "sources" for VOC contamination: Products with high VOC contents that emit VOC's either rapidly during application and curing (typically "wet" products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically "dry" products such as flooring coverings with plasticizers and engineered wood with formaldehyde).

1.5 REFERENCES, RESOURCES:

A. "IAQ Guidelines for Occupied Buildings Under Construction", First Edition, November 1995, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, www.smacna.org.

B. ANSI/ASHRAE 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size", www.ashrae.org

1.6 LEED BUILDING GENERAL REQUIREMENTS:

A. Implement practices and procedures as necessary to meet the project's environmental performance goals as set forth in the specific requirements of this section. Specific project goals that may impact this area of work include: use of recycled-content materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be allowed if such changes compromise the stated LEED BUILDING Performance Criteria.

1.7 CONSTRUCTION IAQ MANAGEMENT PLAN :

A. The Contractor shall prepare a Construction IAQ Management Plan in coordination with each subcontractor and submit the IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00, SUBMITTAL PROCDEURES. The Construction IAQ Management Plan shall meet the following criteria:

1. Construction activities shall be planned to meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors' Association (SMACNA) "IAQ Guidelines for Occupied Buildings under Construction", First Edition, 1995.
2. Absorptive materials shall be protected from moisture damage when stored on-site and after installation.
3. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
4. Filtration media shall be replaced immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999 if the project is pursuing Indoor Air Quality Credit 5: Indoor Chemical Pollutant Source Control.
5. A "Sequence of Finish Installation Plan" shall be developed, highlighting measures to reduce the absorption of VOCs by materials that act as "sinks".
6. Upon approval of the Plan by the Commissioner, it shall be implemented by the Contractor through the duration of the construction process, and documented in accordance with the Submittal Requirements of Sub-Section 1.8 herein.

B. Further description of the Construction IAQ Management Plan requirements is as follows:

1. SMACNA Guidelines: Chapter 3 of the referenced "IAQ Guidelines for Occupied Buildings Under Construction", outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan shall be organized in accordance with the SMACNA format, and shall address measures to be implemented in each of the five categories (including subsections). All subsections shall be listed in the Plan; items that are not applicable for this project should be listed as such.
   a. HVAC Protection
      1) Protect air handling and distribution equipment and air supply and return ducting during construction.
      2) All ductwork arriving on site will be sealed with plastic sheeting and stored on pallets or dunnage until installed.
      3) Cover and protect all exposed air inlets and outlets, openings, grilles, ducts, plenums, etc. to prevent water, moisture, dust and other contaminant intrusion.
      4) Apply protection immediately after ducting.
      5) Protect ducting runs at the end of day's work.
      6) Inspect temporary filtration weekly and replace as required to maintain the proper ventilation rates in the building.
   b. Source Control
      1) Protect stored on-site or installed absorptive or porous materials.
      2) Do not use wet or damaged porous materials in the building.
      3) Recover, isolate, and ventilate containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications.
      4) Exhaust fumes from idling vehicles and gasoline fueled tools through use of funnels or temporary piping.
      5) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, shall be closed when not in use.
   c. Pathway Interruption
      1) Depressurize work areas to contain dust and odors.
      2) Pressurize occupied spaces to prevent intrusion of dust and odors.
      3) Erect barriers to contain construction areas.
      4) Relocate pollutant sources.
      5) Temporarily seal the building and provide 100% outside air for ventilation.
   d. Housekeeping
      1) Store materials on elevated platforms under cover, in a designated dry, clean location, prior to unpacking for installation.
      2) If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.
      3) Institute cleaning activities to remove contaminants from the building prior to occupancy. Clean all coils, air filters, and ductwork prior to performing testing, adjusting, and balancing of HVAC systems.
      4) Sweep the work area on a daily basis. Use an efficient and effective dust collecting method such as damp cloth, wet mop, or vacuum with particulate filters. Activities which produce high levels of dust shall be cleaned up immediately upon completion.
      5) Spills or excess applications of products containing solvents, or with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, must be removed immediately.
      6) Dust all walls prior to application of finishes.
      7) Vacuum all stud tracks prior to application of insulation.
      8) Materials which become contaminated through direct exposure to moisture from

precipitation, plumbing leaks, or condensation shall be replaced by the Contractor.

e. Scheduling
   1) Phase construction such that absorptive materials are installed only in areas that are weathertight.
   2) Schedule activities that utilize "sources" of VOC contamination to take place prior to installing high absorbent materials that will act as "sinks" for contaminants.
   3) Review of the appropriate components of the Construction IAQ Management Plan shall be a regular action topic at weekly site coordination meetings. Implementation of the Plan shall be documented in the meeting minutes.

2. Protection of Materials from Moisture Damage: As part of the "Housekeeping" section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage shall be described. This section should also describe measures to be taken if moisture damage does occur to absorptive materials during the course of construction.

3. Replacement of Filtration Media: Under the "HVAC Protection" section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment shall be provided. The description shall include replacement criteria for filtration media during construction, and confirmation of filtration media replacement for all equipment immediately prior to occupancy.

4. Sequence of Finish Installation for Materials: Where feasible, absorptive materials shall be installed after the installation of materials or finishes which have high short-term emissions of VOC's, formaldehyde, particulates, or other air-borne compounds. Absorptive materials include, but are not limited to: carpets; acoustical ceiling panels; fabric wall coverings; insulations (exposed to the airstream); upholstered furnishings; and other woven, fibrous or porous materials. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paints, wood preservatives and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

5. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:

   <u>OPTION 1 — Flush-Out</u>

   • After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total air volume of 14,000 cu.ft. of outdoor air per sq.ft. of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.

   OR

   • If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu.ft. of outdoor air per sq.ft. of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm/sq.ft. of outside air or the design minimum outside air rate determined in EQ Prerequisite 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu.ft./sq.ft. of outside air has been delivered to the space.

   OR

OPTION 2 — Air Testing

• Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the United States Environmental Protection Agency Compendium of Methods for the Determination of Air Pollutants in Indoor Air and as additionally detailed in the LEED-NC Reference Guide.

• Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

CONTAMINANT	MAXIMUM CONCENTRATION
Formaldehyde	27 parts per billion
Particulates (PM10)	50 micrograms per cubic meter
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
* 4-Phenylcyclohexene (4-PCH)	6.5 micrograms per cubic meter
Carbon Monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels
* This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.	

• For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.

• The air sample testing shall be conducted as follows:

a. All measurements shall be conducted prior to occupancy, but during normal occupied hours and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.

b. The building shall have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.

c. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq.ft., or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.

d. Air samples shall be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

6. Implementation and Coordination: Implement the Construction IAQ Management Plan, and coordinate the Plan with all affected trades. Designate one individual as the Construction IAQ Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation. Include provisions in the Construction IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.

a. Distribution: The Contractor shall distribute copies of the Construction IAQ Management Plan in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

b. Instruction: The Contractor shall provide on-site instruction of appropriate site management to all Contractor's Subcontractors.

c. Monitoring: The Construction IAQ Representative shall monitor the implementation of the Construction IAQ Management Plan.

1.8 SUBMITTALS:

Submit the following LEED-required records and documents in accordance with Section 01 33 00, SUBMITTAL PROCEDURES and Section 01 81 13, SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS.

A. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.07 herein.

B. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contactor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project.

C. Provide the Commissioner with a minimum of 18 photographs as required under the provision for Special Photographs, in accordance with Section 01 32 33, PHOTOGRAPHIC DOCUMENTATION, comprised of at least six photographs taken on three different occasions during construction. The photographs shall document the implementation of the Construction IAQ Management Plan throughout the course of the project construction. Examples include photographs of ductwork sealing and protection, temporary ventilation measures, and conditions of on-site materials storage (to prevent moisture damage). Photographs shall include integral date stamping, and shall be submitted with brief descriptions of the Construction IAQ Management Plan measure documented, or be referenced to project meeting minutes or similar project documents which reference to the Construction IAQ Management Plan measure documented.

D. A copy of the project's TAQ Testing report if applicable.

1.9 QUALITY ASSURANCE:

A. The Contractor shall be responsible for preparing and implementing the Construction IAQ Management Plan and shall coordinate and incorporate the work of its subcontractors in the IAQ Management Plan.

B. Responsibility of Subcontractors: Subcontractors for this project shall be responsible to cooperate with the Contractor in the preparation and implementation of the Construction IAQ Management Plan.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 19

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. OPR and BoD documentation are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SUMMARY:

A. This Section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems, and equipment being commissioned.

B. This Section includes:
1. Definitions
2. Commissioning Team
3. City's Responsibilities
4. Each Contractor's Responsibilities
5. Commissioning Authority's/Agent's (CxA) Responsibilities
6. Commissioning Documentation
7. Submittals
8. Coordination

1.3 RELATED SECTIONS: Include without limitation the following:

A. "HVAC Commissioning Requirements" indicated in other sections of the project specifications for specific requirements for commissioning HVAC systems.

B. This project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning shall be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor shall cooperate with the CxA and provide whatever assistance is required.

C. Related Sections include without limitation the following:
1. Section 01 10 00 SUMMARY
2. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
3. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
5. Section 01 79 00 DEMONSTRATION AND OWNERS PRE-ACCEPTANCE ORIENTATION
6. Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

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. Commissioner: The Commissioner of the Department of Design and Construction of the City of New York, his/her successors, or duly authorized representative(s).

D. BoD: Basis of Design: A document, prepared by the Consultant Architect/Engineer, 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.

E. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

F. CxA: Commissioning Agent (Aka Commissioning Authority) under separate contract with the City of New York to provide Commissioning Services for this project.

G. OPR: Owner's (City of New York) Project Requirements: A document, prepared by the Consulting Architect/Engineer) 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.

H. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

I. TAB: Testing, Adjusting, and Balancing.

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. Consultant Architect/Engineer and other concerned entities.

1.6 CITY'S RESPONSIBILITIES:

A. Provide the OPR documentation to the Commissioning Agent (CxA) for use in developing the commissioning plan; systems manual; operation and maintenance training plan; and testing plans and checklists.

B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

C. Provide the BoD documents, prepared by the Consulting Architect/Engineer and approved by the Commissioner, to the Commissioning Agent (CxA) for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

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. Review and accept commissioning process test procedures provided by the CxA.
4. Review and accept construction checklists provided by the CxA.
5. Perform testing required in the Commissioning Schedule as per the Commissioning Process test procedures provided by the CxA.
6. Complete installation checklists as Work is completed and return to CxA through the Resident Engineer.
7. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
8. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
9. Submit As-Built documents, operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39, CONTRACT RECORD DOCUMENTS.
10. Provide orientation sessions for operation and maintenance personnel (sessions will be video recorded by the CxA) in accordance with Section 01 79 00, DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:

A. Organize and lead the commissioning team.

B. Prepare a construction-phase commissioning plan. Collaborate through the Resident Engineer 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.

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 Resident Engineer to convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The Commissioning Agent CxA will prepare and distribute minutes to commissioning team members and attendees within three workdays of the commissioning meeting.

E. At the beginning of the construction phase, coordinate with the Resident Engineer'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 training sessions, TAB Work, and Project completion.

F. Observe and inspect construction. 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 Project-specific test and inspection procedures and checklists.

H. Coordinate with the Resident Engineer to schedule, direct, witness, and document tests, inspections, and systems startup.

I. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.

J. Certify date of acceptance and startup for each item of equipment for start of warranty periods.

K. 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.

L. Record and edit demonstration and orientation sessions on DVD.

M. Prepare commissioning reports.

N. Assemble the final commissioning documentation, including the commissioning report and Systems Manual.

1.9 COMMISSIONING DOCUMENTATION:

The Contractor shall assist the Commissioning Agent (CxA) in the development and compiling of the following Commissioning Documentation:

A. Index of Commissioning Documents: The Commissioning Agent (CxA) will prepare an index including the storage location of each document.

B. OPR: A written document prepared by the Commissioning Agent (CxA) that details the functional requirements of the Project and expectations of how it will be used and operated. This document includes the Project and design goals, measurable performance criteria, budgets, schedules, success criteria, and supporting information.

C. BoD Document: A document prepared by the Consulting Architect/Engineer 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 explain the designed systems.

D. Commissioning Plan: A document prepared by the Commissioning Agent (CxA) that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process.

E. Test Checklists: The Commissioning Agent (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.

F. 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.

G. Test and Inspection Reports: The Commissioning Agent (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.

H. Corrective Action Documents: The Commissioning Agent (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.

I. Issues Log: The Commissioning Agent (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.

1. Commissioning Report: The Commissioning Agent (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.

J. Systems Manual: The Commissioning Agent (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. Commissioning Plan Pre-final Submittal: The Commissioning Agent (CxA) will submit six (6) copies of the pre-final commissioning plan to the Commissioner for review and distribution.

B. Commissioning Plan Final Submittal: The Commissioning Agent (CxA) will submit six (6) hard copies and electronically formatted information of the final commissioning plan to the Commissioner. The final submittal will address previous review comments.

C. Test and Inspection Reports: CxA will submit test and inspection reports.

D. Corrective Action Documents: CxA will submit corrective action documents.

1.11 COORDINATION:

A. Coordinating Meetings: The Commissioning Agent (CxA) will coordinate with the Resident Engineer'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.

B. Pre-testing Meetings: The Commissioning Agent (CxA) will coordinate with the Resident Engineer 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.

C. Testing Coordination: The Commissioning Agent (CxA) will coordinate with the Resident Engineer 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.

1. Coordinate schedule times with the Resident Engineer for tests, inspections, obtaining samples, and similar activities.

D. Manufacturers' Field Services: The Commissioning Agent (CxA) will coordinate services of manufacturers' field services.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 OPERATION & MAINTENANCE MANUALS

A. General
   1. The CxA shall review the Operation & Maintenance manuals provided by the Contractor or subcontractors 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.

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 training sessions.

C. System Operations Manual
   1. The CxA shall prepare and deliver these documents with inputs from other agencies. The contractors will confirm the proper documents are onsite and readily available. Typically, the manual includes the following:
      a. Commissioned systems single line diagrams (Mechanical, Electrical, Plumbing, and Building Management System (BMS) subcontractors).
      b. As built sequences of operations, control drawings and original set points (Design Consultant and BMS subcontractor)
      c. Operating instructions for integrated building systems (mechanical and BMS subcontractors).
      d. Recommended schedule of maintenance requirements and frequency (subcontractors).
      e. Recommended schedule for calibrating sensors and actuators (BMS subcontractor)

3.2 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 training 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. For additional prescription pertinent to instruction, refer to other specific divisions for demonstration and instruction requirements.

3.3 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. If agreed upon by facility, Seasonal Testing can also be used for the Warranty Review. During which the CxA will interview the occupants, 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.

3.4 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

NO TEXT

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

NYC DDC
Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary

Contractor

Dated _____ , 20____

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

Dated _____ , 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20____

FMS ID: **NC-61A**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Department of Design and Construction

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

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn, NY 11222**
CITY OF NEW YORK

Fratello Construction Corp.
Contractor

Dated December 12, 20 18

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

8.17.18
JP

Dated August 17, 20 18

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20 _____

Department of Design and Construction

PROJECT ID: NC-61A

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

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

VOLUME 3 OF 3

ADDENDUM TO THE GENERAL CONDITIONS

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: 329 Greenpoint Avenue
BOROUGH: Brooklyn, NY 11222
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

DEP

Quennell Rothschild & Partners

Date: June 5, 2018

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

The General Conditions are hereby amended in accordance with the terms and conditions set forth in this Addendum.

I. PROJECT DESCRIPTION

FMS #: **NC-61A**
PROJECT NAME: **Renovation of the Newtown Creek Nature Walk Phase 3 (Garden)**

PROJECT DESCRIPTION: This Project consists of a garden area on a demapped street, including paved and planted areas, custom fabricated seating and shade structures, walls and fencing, water supply, irrigation drainage, electrical work and lighting.

PROJECT LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn**
CITY OF NEW YORK
ZIP CODE: **NY, 11222**
COMMUNITY BOARD #: **Brooklyn CB 1**

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.

Section	Sub-Section	Sub-Section	Applies	Does not Apply	Applies as Amended
01 1000	1.4 (B)	Scope and Intent / LEED		X	
	1.4(C)	Scope and Intent / Commissioning		X	
01 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		

Section	Sub-Section	Sub-Section	Applies	Does not Apply	Applies as Amended
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	

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	**720 CCDs**	
Article 15 Contract	Liquidated Damages	For each consecutive calendar day over completion time	**$600**	
Article 17 Contract	Sub-Contracts	Not to exceed Percent of Contract Price	**60%**	
Article 21 Contract	Retainage	Percent of Voucher	If 100% bonds are required	**5%**
			If 100% bonds are not required, and Contract Price is $1,000,000 or less	**5%**
			If 100% bonds are not required, and Contract Price is more than $1,000,000	**10%**
Article 24 Contract	Deposit Guarantee	Percent of Contract Price	**1%**	
Article 24 Contract	Period of Guarantee		See Schedule B of the Addendum to the General Conditions	
Article 74 Contract	Statement of Work		Addenda, numbered: three (3)	
Article 75 Contract	Compensation to be Paid to Contractor		Amount for which the Contract was Awarded: Nine million, six hundred thousand Dollars ($ 9,600,000.00)	
Article 79 Contract	MWBE Program		See M/WBE 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
■ Commercial General Liability Art. 22.1.1	This Contract requires Commercial General Liability Insurance (CGL) that is at least as broad as ISO Form CG 00 01 (see Section 22.1.1 of the New York City Standard Construction Contract). CGL policies that include endorsements that add exclusions to ISO Form CG 00 01 do not comply with the Contract. The Department may, in its sole discretion, accept endorsements that add exclusions, but the Department will generally reject endorsements that add exclusions that exempt all or part of the Work of the Project. For example, if the Project includes Work on a roof of a four-story building, the Department will reject a CGL policy that includes a "Three Story Height Limitation Endorsement." The minimum limits shall be $1,000,000.00 per occurrence and $2,000,000.00 per project aggregate applicable to this **Contract.** Additional Insureds: 1. City of New York, including its officials and employees, with coverage at least as broad as ISO Forms CG 20 10 and CG 20 37, and 2. All person(s) or organization(s), if any, that Article 22.1.1(b) of the **Contract** requires to be named as Additional Insured(s), with coverage at least as broad as ISO Form CG 20 26. The Additional Insured endorsement shall either specify the entity's name, if known, or the entity's title (e.g., Project Manager). 3. _____

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Workers' Compensation Art. 22.1.2 ■ Disability Benefits Insurance Art. 22.1.2 ■ Employers' Liability Art. 22.1.2 ☐ Jones Act Art. 22.1.3 ☐ U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.3	Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction. **Note**: The following forms are acceptable: (1) New York State Workers' Compensation Board Form No. C-105.2, (2) State Insurance Fund Form No. U-26.3, (3) New York State Workers' Compensation Board Form No. DB-120.1 and (3) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance. Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.
■ Builders' Risk Art. 22.1.4	100 % of total value of **Work** **Contractor** the Named Insured; the **City** both an Additional Insured and one of the loss payees as its interests may appear. If the **Work** does not involve construction of a new building or gut renovation work, the **Contractor** may provide an installation floater in lieu of Builders Risk insurance. Note: Builders Risk Insurance may terminate upon **Substantial Completion** of the **Work** in its entirety.
■ Commercial Auto Liability Art. 22.1.5	$1,000,000.00 per accident combined single limit If vehicles are used for transporting hazardous materials, the **Contractor** shall provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
☐ Contractor's Pollution Liability Art. 22.1.6	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
☐ Marine Protection and Indemnity Art. 22.1.7(a)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
☐ Hull and Machinery Insurance Art. 22.1.7(b)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
☐ Marine Pollution Liability Art. 22.1.7(c)	$_____ each occurrence Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 ☐ Ship Repairers Legal Liability	$_____ each occurrence

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
[OTHER] Art. 22.1.8 □ Collision Liability/Towers Liability	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Railroad Protective Liability _____	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Asbestos Liability _____	Only required of the Contractor or Subcontractor performing any required asbestos removal. $1,000,000 each occurrence, $2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal. Additional Insureds: 1. City of New York, including its officials and employees, 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.

[OTHER] Art. 22.1.8 □ Boiler Insurance_____	$200,000
[OTHER] Art. 22.1.8 ■ Professional Liability In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.	$1,000,000 per occurrence The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of $1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer. Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certificates of Insurance

All certificates of insurance (except certificates of insurance solely evidencing Workers' Compensation Insurance, Employer's Liability Insurance, and/or Disability Benefits Insurance) must be accompanied by one of the following:

(1) the Certification by Insurance Broker or Agent on the following page setting forth the required information and signatures;

-- OR --

(2) copies of all policies as certified by an authorized representative of the issuing insurance carrier that are referenced in such certificate of insurance. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certification by Insurance Broker or Agent

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

_____

[Name of broker or agent (typewritten)]

_____

[Address of broker or agent (typewritten)]

_____

[Email address of broker or agent (typewritten)]

_____

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

_____

[Signature of authorized official or broker or agent]

_____

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

State of .....)
) ss:
County of .....)

Sworn to before me this

_____ day of _____, 20__

_____

NOTARY PUBLIC FOR THE STATE OF_____

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART IV. Address of Commissioner

Wherever reference is made in Article 7 or Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents 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, 4th Floor

Long Island City, New York 11101

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
07 92 00	Joint Sealants	5 years
26 50 00	Photovoltaic Panels	20 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.

SHEET NO.	DWG NO	DRAWING TITLE
	GENERAL	
1	T-101.00	TITLE SHEET
2	T-102.00	DRAWING LIST
	SURVEY	
3	SU-101.00	TOPOGRAPHIC SURVEY - 1
4	SU-102.00	TOPOGRAPHIC SURVEY - 2
	BORING	
5	B-101.00	BORING PLAN
6	B-102.00	BORING LOG
	CIVIL	
7	C-100.00	CIVIL LEGEND, SYMBOLS & ABBREVIATIONS
8	C-101.00	UTILITY DEMOLITION PLAN - WEST
9	C-102.00	UTILITY DEMOLITION PLAN - EAST
10	C-103.00	UTILITY PLAN - WEST
11	C-104.00	UTILITY PLAN - EAST
12	C-105.00	SITE DETAILS
13	C-106.00	DRAINAGE DETAILS
	LANDSCAPE	
14	L-101.00	SURFACE FEATURES REMOVALS PLAN
15	L-102.00	STAGING PLAN
16	L-103.00	LEGEND FOR SITE PLANS
17	L-104.00	SITE PLAN - WEST
18	L-105.00	SITE PLAN - CENTRAL
19	L-106.00	SITE PLAN - EAST
20	L-107.00	SITE STONE PLAN
21	L-108.00	FILL MATERIALS PLAN
22	L-109.00	DIMENSION PLAN - WEST A
23	L-110.00	DIMENSION PLAN - WEST B

24	L-111.00	DIMENSION PLAN - CENTRAL A
25	L-112.00	DIMENSION PLAN - CENTRAL B
26	L-113.00	DIMENSION PLAN - EAST A
27	L-114.00	DIMENSION PLAN - EAST B
28	L-115.00	DIMENSION PLAN - NORTH-CENTRAL AREA
29	L-116.00	GRADING PLAN - WEST
30	L-117.00	GRADING PLAN - CENTRAL
31	L-118.00	GRADING PLAN - EAST
32	L-119.00	PLANT SCHEDULE
33	L-120.00	PLANTING PLAN - WEST
34	L-121.00	PLANTING PLAN - CENTRAL
35	L-122.00	PLANTING PLAN - EAST
36	L-123.00	PLANTING PLAN - AREAS A, B, C, D
37	L-201.00	STEPPED SEATING AREA MATERIALS & GRADING PLAN
38	L-202.00	STEPPED SEATING AREA DIMENSION PLAN
39	L-203.00	BRIDGE AREA MATERIALS & GRADING PLAN
40	L-204.00	BRIDGE AREA DIMENSION PLAN
41	L-205.00	FAN PAVING AREA MATERIALS & DIMENSION PLAN
42	L-206.00	TREE FOSSIL AREA MATERIALS & DIMENSION PLAN
43	L-301.00	SITE SECTIONS - 1
44	L-302.00	SITE SECTIONS - 2
45	L-303.00	SITE SECTIONS - 3
46	L-401.00	SITE DETAILS - 1
47	L-402.00	SITE DETAILS - 2
48	L-403.00	SITE DETAILS - 3
49	L-404.00	SITE DETAILS - 4
50	L-405.00	SITE DETAILS - 5
51	L-406.00	SITE DETAILS - 6
52	L-407.00	SITE DETAILS - 7
53	L-408.00	SITE DETAILS - 8
54	L-409.00	SITE DETAILS - 9
55	L-410.00	SITE DETAILS - 10
56	L-411.00	SITE DETAILS - 11
57	L-412.00	SITE DETAILS - 12

58	L-413.00	SITE DETAILS - 13
59	L-414.00	SITE DETAILS - 14
60	L-415.00	SITE DETAILS - 15
61	L-416.00	SITE DETAILS - 16
62	L-417.00	SITE DETAILS - 17
63	L-418.00	SITE DETAILS - 18
64	L-419.00	SITE DETAILS - 19
65	L-420.00	SITE DETAILS - 20
66	L-421.00	SITE DETAILS - 21
67	L-422.00	SITE DETAILS - 22
68	L-423.00	SITE DETAILS - 23
	IRRIGATION	
69	I-101.00	IRRIGATION PLAN
70	I-102.00	IRRIGATION DETAILS
	ARCHITECTURAL	
71	A-101.00	SITE KEY PLAN, GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS
72	A-102.00	SOUTH FENCE AND GATE
73	A-103.00	NORTH FENCE
74	A-104.00	EAST FENCE AND GATE
75	A-105.00	WEST RAILING
76	A-106.00	CIRCULAR SHELTER SEATING AND CONDUIT ACCESS DETAILS
77	A-107.00	DETAILS
	STRUCTURAL	
78	S-101.00	STRUCTURAL GENERAL NOTES
79	S-102.00	STRUCTURAL STANDARD DETAILS
80	S-103.00	PILE PLAN
81	S-104.00	PILE PLAN DETAILS
82	S-105.00	PILE NOTES AND DETAILS
83	S-106.00	OVERALL PLAN @ GRADE
84	S-107.00	OVERALL TOP PLAN
85	S-108.00	WHALE CREEK STEPPED SEATING PLAN & SECTIONS
86	S-109.00	CONCRETE SECTIONS AND DETAILS
87	S-110.00	UTILITY SHED PLAN & SECTIONS
88	S-111.00	CIRCULAR SHELTER FOUNDATION PLAN & SECTIONS

89	S-112.00	CIRCULAR SHELTER FRAMING PLAN AND DETAILS
90	S-113.00	BOAT SHELTER FRAMING PLAN & SECTIONS
91	S-114.00	STEEL SECTIONS AND DETAILS
	ELECTRICAL	
92	E-101.00	SYMBOLS AND ABBREVIATIONS
93	E-102.00	ELECTRICAL SITE PLAN
94	E-103.00	LIGHTING AND POWER PLAN - SHEET 1
95	E-104.00	LIGHTING AND POWER PLAN - SHEET 2
96	E-105.00	LIGHTING AND POWER PLAN - SHEET 3
97	E-106.00	LIGHT FIXTURE SCHEDULE
98	E-107.00	ONE-LINES, PANEL SCHEDULES AND PHOTOCELL CONTROL
99	E-108.00	MISCELLANEOUS ELECTRICAL DETAILS

SCHEDULE D

Electrical Motor Control Equipment

(Reference: 01 3506, Article 3.8 of the DDC Standard General Conditions)

NO TEXT

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

SCHEDULE F

Submittals Schedule

(Reference: Section 01 3300 Article 1.5 (C) of the General Conditions)

The Schedule set forth below lists all submittal requirements for the Contract. In the event of any conflict between the Specifications and this 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.

CONSULTANT:
TELEPHONE NUMBER:
DDC PROJECT MANAGER:
TELEPHONE NUMBER:

DATE: _____

APPROVED: _____
(DDC RESIDENT ENGINEER/CPM)

REPORT DATE		FMS ID #/PROJECT ID #: NC-61A CONTRACT REGISTRATION #: PROJECT NAME: NEWTOWN CREEK NATURE WALK PHASE 3							CONTRACT #: **Contract 1 – GENERAL CONSTRUCTION** TRADE: SHOP DRAWING LOG SHEET #								
SPEC. SECT. #	DESCRIPTION	COORD. WITH CONTR.	SUBMITTAL			SUB. DATE	REQ'D DEL.	FABRIC. TIME	SUBMISSIONS								
			SHOP DWG.	SAMPLE	CAT. CUTS				REC'D	RET'D	ACTION	REC'D	RET'D	ACTION	REC'D	RET'D	ACTION
01 3526	Safety and Health Program	X															
01 3526	Contractor's Safety Plan	X															
01 3591	Historic Treatment Plan	X															
01 5000	Site Plan		X														
01 5000	Reports	X															
01 5423	NYC DOB Scaffold & Sidewalk Shed Permits	X	X														

01 5423	Site Logistics/Site Safety Plan	X															
01 5423	Scaffold & Shed Installation Drawings		X														
01 7900	Instruction Program for Demonstration & Orientation	X															
01 7900	Qualification Data	X															
014550	Leakage Test Report	X	X														
024100	Site Inspection Records	X	X														
028013	Work Plan & Schedule	X															
028013	Project Notifications	X															
028013	Permits & Licenses	X															
028013	Description of Emergency Procedures	X															
028013	Material Safety Data Sheets	X															
028013	List of Personnel & evidence of training	X															
028013	Progress Logs, Visitor Logs, Disposal Logs, Safety Logs	X															
033000	Concrete Products				X												
033000	Concrete Design Mix		X														
033000	Reinforcing Drawings		X														

033000	Construction Joint Layout Drawings		X														
033000	Concrete Delivery Tickets	X	X														
033000	Welding Certificates	X	X														
033000	Materials Certificates	X	X														
033000	Certified Material Test Reports	X	X														
033000	Floor Surface Measurements	X	X														
033000	Concrete Products				X												
033000	Concrete Design Mix	X															
033000	Formwork Drawings		X														
033000	Placement Schedule		X														
033000	Formwork Samples			X													
033000	Mock-up			X													
033000	Aggregate Samples			X													
033000	Testing Agency Qualification	X	X														
033000	Materials Certificates	X	X														
033000	Certified Material Test Reports	X	X														
033300	Architectural Concrete	X															
034500	Precast Architectural Concrete		X	X	X												
034500	Concrete Mix Designs				X												

034500	Cylinder Test Reports				X												
034500	Air Content Tests				X												
034500	Grout Tests				X												
034500	Design Calculations for Wall Panels and Coping				X												
050810	Material Certifications	X	X														
050810	Material Test Results	X	X														
051200	Structural Steel Framing Products				X												
051200	Fabrication of Structural Steel Components		X														
051200	Design Load Analysis Data Reports	X	X														
051200	Installer Qualifications	X															
051200	Fabricator Qualifications	X															
051200	Shop-Painting Qualifications	X															
051200	Professional Engineer Qualifications	X															
051200	Testing Agency Qualifications	X															
051200	Welding Certificates	X															
051200	Paint Compatibility Certificates	X															
051200	Mill Test Reports	X															

051200	Product Test Reports	X															
051200	Source Quality-Control Reports	X															
051200	Field Quality-Control Reports	X															
055000	Metal Fabrications		X														
055000	Concrete Anchor Installation		X														
055000	Structural Component Calculations	X	X														
055000	Concrete and Masonry Drilled Anchors	X			X												
055000	U-Channel Concrete Inserts	X			X												
055000	Passivation Method for Stainless Steel Members	X	X														
055000	Hot-Dip Galvanizing Certifications	X	X														
055600	Metal Castings	X															
057000	Stainless Steel Fences and Railings		X	X	X												
057000	Structural Analysis Data				X												
057000	Fasteners			X													
057000	Sliding Gates		X														
057000	Linear Railing and Fencing Members			X													
057000	Fittings and Brackets			X													

057000	Welded Connections			X													
057000	Assembled Samples of Railing and Fencing Systems			X													
057000	Mill Certificates	X	X														
057000	Welding Certificates	X	X														
057000	Professional Engineer Qualifications	X															
057000	Product Test Reports	X	X														
079200	Joint Sealants			X	X												
079200	Qualification Data				X												
079200	Product Test Reports				X												
079200	Preconstruction Laboratory Test Schedule				X												
079200	Field-Adhesive Test Reports				X												
079200	Sample Warranties				X												
221000	Product Data and Information				X												
221000	Layout, Sections, and Schedule		X														
260500	Schedule of Equipment	X	X		X												
260500	Product Data and Information				X												
260500	Connection and Schematic Diagrams		X														

260500	Diagrams Showing Connections to Field Equipment		X														
260500	Raceway Layout Drawings showing Conduits, Boxes, and Panels		X														
260500	Record Documents	X	X		X												
260500	Maintenance Manuals	X			X												
260519	Product Data and Information				X												
260519	Testing Firm Qualifications	X															
260519	Shop & Field Test Reports	X	X														
260519	Acceptance Testing Report	X	X														
260519	Material Safety and Data Sheets	X															
260526	Grounding and Bonding for Electrical Systems		X		X												
260526	Field Test Report	X	X														
260529	Hangers and Supports	X															
260533	Raceway and Boxes	X															
260543	Underground Raceways & Ducts		X		X												
260543	Professional Engineer Qualifications	X															

262200	Low Voltage Transformers		X		X												
262200	Test Methods	X															
262200	Shop & Field Test Reports	X	X														
262200	Manufacturer's Installation Instructions	X			X												
262200	Operations and Maintenance Manuals	X			X												
262416	Panelboards		X		X												
262416	Certificates of Compliance	X			X												
262416	Shop Test Reports	X	X														
262416	Operations and Maintenance Manuals	X	X														
262726	Wiring Devices				X												
265000	Lighting Fixtures and Devices		X		X												
265000	Photometric Reports		X														
265000	Field Test Reports	X															
265000	Manufacturers Performance Certificates	X	X														
265000	Manufacturers Test Reports	X	X														
265000	Manufacturers Installation Instructions	X	X														
265000	Operations and Maintenance Manuals	X	X														

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265600	Photometric Reports		X														
265600	Mock-up and Prototypes			X													
265600	Manufacturer's Certificates for Equipment Performance	X			X												
265600	Manufacturer's Test Reports	X			X												
265600	Manufacturer's Installation Instructions	X			X												
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265600	Operations and Maintenance Manuals	X															
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310916	Safety Devices				X												
310916	Calibration Equipment				X												
310916	Tester Qualifications	X															
310917	Name & Qualifications of Testing Engineer	X															
310917	PDA Testing Procedure & Equipment	X	X														
310917	PDA Test Report	X	X														
312316	Dewatering Plan		X														

312323	Backfill Lab Reports	X	X														
312323	Daily Reports	X															
312323	Waste Characterization Testing Procedures	X															
312323	Lab data with chain of custody forms	X															
312323	Waste manifests & bills of lading	X															
312323	Regulatory notifications or documents	X															
312323	Soil or backfill weight tickets	X															
312500	Inspection Reports	X	X														
312500	SWPPP	X	X														
313219	Demarcation Fabric	X															
316216	Pile Location Plan, Size and Numbering System		X														
316216	Pile Installation Sequence		X														
316216	As-Built Pile Location Survey		X														
316216	Additional Pile Locations		X														
316216	Pile Driving Equipment	X			X												
316216	Material Certification for Piling (Mill Test Reports)	X			X												

316216	Detailed Welding Drawings and Material Specifications		X														
316216	Proposed Pile Slicing Detail		X														
316216	Vibration Monitoring Plan		X														
316216	Name & Qualifications of Monitoring Engineer	X	X														
321010	Steel Facing		X														
321010	Concrete Design Mix	X			X												
321010	Concrete Delivery Tickets	X															
321216	Design Mix for Asphalt Binder Course				X												
321216	Design Mix for Asphalt Wearing Course				X												
321216	Sieve Analysis - Crushed Stone				X												
321313	Concrete Design Mix	X			X												
321313	Concrete Delivery Tickets	X															
321313	Sieve Analysis - Crushed Stone	X			X												
321313	Sealant			X													
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321410	Stabilizer Material				X												
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321410	Gravel Top Course			X													
321410	Sieve Analysis - Gravel Top Course	X															
321410	Sieve Analysis - Crushed Stone	X															
321420	Limestone Pavement Layout		X														
321420	Stone			X													
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321420	Sealant			X													
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323119	Fence Shop Drawings		X														
323119	Fence Mock-up			X													
323119	Fence Material				X												
323119	Structural Calculations	X	X														

324010	Seating Elements		X														
324010	Tables		X														
324010	Drinking Fountain		X														
324010	Epoxy Grout				X												
324010	Stone Adhesive				X												
324010	Mortar Coloring			X	X												
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324010	Etching Sample			X													
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324030	Steel Gratings		X	X	X												
324030	Pipe Seats		X														
324030	PV Battery Post		X														
324030	Trash Receptacle		X														
324030	Bridge		X														
324030	Bench with Shade Roof		X														
324030	Metal			X													
324050	Signs		X	X													
328400	Irrigation Products				X												

328400	Delegated-Design Submittal	X	X														
328400	Coordination Drawings		X														
328400	Irrigation Layout		X														
328400	Qualification Data	X	X														
328400	Field Quality-Control Reports	X	X														
328400	Operation and Maintenance Data	X	X														
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329320	Perlite				X												
329320	Topsoil				X												
329320	Compost				X												
329320	Blended Soil Mix				X												

329320	Test Results for Topsoil				X												
329320	Test Results for Sand				X												
329320	Test Results for Compost				X												
329320	Test Results for Blended Soil Mix				X												
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329330	Geotextile				X												
329330	Tree Anchor System				X												
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329330	Sources of Plant Material				X												
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330513	Sewer Manhole Structures		X		X												
330513	Concrete Test Reports				X												
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330555	Pipe Joints, Fittings, Sleeves, Cleanouts		X		X												
330555	Piping Layouts		X														
330555	Pipe Alignment Survey & Laying Schedule		X														

330555	Pipe, Joints, Fittings, Sleeves, Harnessing and Cleanouts				X												
330555	Certificates of Compliance	X			X												
331219	Hydrants		X		X										.		
331219	Hydrant Test Results & Inspection Data	X	X														
331300	Disinfection	X															
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CONTRACT # 1

GENERAL CONSTRUCTION WORK

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SECTION 01 45 50
LEAKAGE TESTS

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 SECTION INCLUDES

A. Testing for any signs of leakage in all pipelines and structures required to be watertight.

1. Test all pipelines with water under the specified pressures.

1.3 OPERATION OF EXISTING FACILITIES

A. Conduct all tests in a manner to minimize as much as possible any interference with the day-to-day operations of existing facilities or other contractors working on the site.

1.4 REFERENCES

A. Codes and standards referred to in this Section are:

B. ACI 350.1R-93 - Manual of Concrete Practice, Part 4

C. ASTM C 828 - Practice for Low-Pressure Air Test of Vitrified Clay Pipe Lines (4 to 12 inches)

D. ASTM C 924 - Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method

E. AWWA C 600 - Installation of Ductile-Iron Water Mains and Their Appurtenances

1.5 PERFORMANCE REQUIREMENTS

A. Written Notification of Testing: Provide written notice when the work is ready for testing, and make the tests as soon thereafter as possible.

1. Personnel for reading meters, gauges, or other measuring devices, will be furnished by the Commissioner.

2. Furnish all other labor, equipment, air, water and materials, including meters, gauges, smoke producers, blower, pumps, compressors, fuel, water, bulkheads and accessory equipment.

1.6 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Testing Report: Prior to placing the sewer system in service submit for review and approval a detailed bound report summarizing the leakage test data, describing the test procedure and showing the calculations on which the leakage test data is based.

PART II - PRODUCTS

Not Used

PART III - EXECUTION

3.1 PRESSURE TESTS OF EXPOSED PLANT PIPING

A. Testing: Pressure test exposed pipelines for leakage by maintaining the fluid in the pipe at the specified pressure for a period of 60 minutes. Examine all accessible joints during the test. Stop all visible leakage.

B. Test Pressures: Test the various pipelines at the test pressures specified in Section 40 05 18.

3.2 PRESSURE TESTS OF BURIED OR CONCEALED PLANT PIPELINES AND WATER MAINS

A. Testing: Completely backfill all harnessed sections of buried piping before such sections are tested.

1. Pressure test buried or concealed pipelines for leakage by maintaining the fluid in the pipe at the specified pressure for a minimum period of 4 hours.

2. Pressure test the piping for leakage as a whole or in sections, valved or bulkheaded at the ends. Apply the specified pressure to the piping through a tap in the pipe by means of a hand pump or other approved method. Do not use air for testing.

B. Test Pressures: Test the piping at the test pressures specified in Sections 33 05 50 and 40 05 18.

C. Allowable Leakage: Stop all visible leakage. Do not allow leakage for any piping, as determined by the above test, to exceed the allowable leakage for cast-iron water mains as given by the following formula in Section 5.2 of AWWA C600:

$$L = \frac{S \times D \times (P)^{1/2}}{148{,}000}$$

in which L is the allowable leakage in gallons per hour, S is the length of water main tested in feet, D is the nominal diameter of the pipe in inches and P is the average test pressure in psi gauge.

3.3 VALVE TESTING

A. Testing: Operate valves in the section under test through several complete cycles of closing and opening. In addition, have the test pressure for each valve, when in the closed position, applied to one side of the valve only. Test each end of the valve in this manner.

B. Test Pressure: Test each valve at the same test pressure as that specified for the pipe in which the valve is installed.

C. Leakage: Stop all external and internal leakage through the valves.

D. Movement: Stop all valve movement or structural distress.

3.4 REPAIR OF PIPING LEAKS

A. Procedures: Repair leaks as follows:

1. Replace broken pipe or joint assemblies found to leak.

2. When leakage occurs in excess of the specified amount, locate and repair defective valves, pipe, cleanouts or joints.

3. If the excess leakage is determined to be caused by defective materials furnished, improper workmanship, or damage to the materials, make the necessary repairs or replacements at no addition to the Contract Price.

4. If defective portions cannot be located, remove and reconstruct as much of the original work as necessary to obtain piping that meets the leakage requirements specified herein and retest, all at no addition to the Contract Price.

3.5 LEAKAGE TESTS FOR CAST-IN-PLACE, WATERHOLDING CONCRETE STRUCTURES

A. Perform leakage tests on concrete wet wells, tanks, junction chambers and similar water holding structures before backfilling, by filling the structure with water to the maximum water level. Maximum level is defined as 1) overflow level for tanks with overflow facilities; 2) top of wall for open-topped tanks without overflow facilities; 3) underside of roof slab for enclosed tanks without overflow facilities. Test shall conform to the requirements of ACI 350.1R-93/AWWA 400-93. Testing shall not be performed before fourteen (14) days after all portions of structure elements have been completed, and not before all the structure elements have attained the specified compressive strength. The Contractor shall be responsible for

proper disposal of all water used for leakage testing. The method of disposal shall be subject to approval by the Commissioner.

1. Fill the structure to be tested with water to the maximum level. Allow a 3-day interval between the time the structure is filled with water and the start of the leakage testing to minimize the effect of the concrete absorption on the test results.

2. Inspect the walls and all joints for leakage. If structural distress is observed, report immediately to the Commissioner. Visible flowing leaks or damp spots that show on the exterior surface of the structure shall not be permitted.

3. After the 3-day interval in Step 1 above, begin the test and observe the water level in the structure for a 72 hour period.

    a. Make an inspection for locations of leakage through the exterior surface of the structure, especially in areas around fittings; and construction, expansion and other joints. Monitor underdrains for any increase in flow.

    b. Continue the test for the number of days it would take to produce a ½-inch drop in water level at the maximum allowed water loss described below. Take water level readings at 24 hour intervals at the same time of day to minimize the effects of temperature.

    c. Leakage will be considered acceptable if:

        (1) There are no visible leakages or visible damp areas and

        (2) The amount of water loss in each 24 hour period is not more than 0.1 percent of the volume to which the structure was filled, after correcting for the evaporation loss or precipitation gain in accordance with ACI 350.1R-93, Chapter 3.

    d. If visible leaks appear, submit, for approval, the repair procedure and materials for all elements of structure. Make the repairs at no additional cost to the Commissioner. Leakage test the structure again after repairs. Continue repair and re-test cycle until the structure passes the leakage test.

    e. Damp areas are not permitted at any location on the tank wall. Damp areas are defined as spots where moisture can be picked up on a dry hand. All such areas shall be repaired as necessary at no additional cost to the City of New York.

B. Perform leakage tests for concrete roof slabs of structures by holding about 2 inches of water over the top of the slab for a period of two to three days. If roof slabs are to be overlain with roofing materials, test the slabs prior to installing the roofing materials. If there is any leakage through cracks or joints resulting in damp areas on the underside of the roof slab, or if the cracks at the top surface are wider than ten (10) mils, submit, for approval, repair procedures

and materials for roof slab repair. Make the repairs at no additional cost to the City of New York.

1. If the excess leakage is determined to be caused by defective materials improper workmanship, or damage to the slab, make the necessary repairs to replacements at no addition to the Contract Price.

2. If defective portions cannot be located, remove and reconstruct as much of the original work as necessary to obtain a concrete roof slab that meets the leakage requirements specified herein and retest, all at no addition to the Contract Price.

END OF SECTION 01 45 50

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SECTION 02 41 00
DEMOLITION

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.

1.2 SECTION INCLUDES

A. All work necessary for the removal and disposal of piping, equipment and roadways, or any part thereof including masonry, steel, reinforced concrete, plain concrete, and any other material or equipment shown or specified to be removed.

B. Basic Procedures and Schedule: Carry out demolition so that adjacent structures, which are to remain, are not endangered. Schedule the work so as not to interfere with the day to day operation of the existing facilities. Do not block entrances to Newtown Creek Wastewater Treatment Plant.

C. Additional Requirements: Provide dust control and make provisions for safety.

1.3 QUALITY ASSURANCE

A. Limits: Exercise care to break concrete well for removal in reasonably small masses. Where only parts of a structure are to be removed, cut the concrete along limiting lines with a suitable saw so that damage to the remaining structure is held to a minimum.

1.4 SUBMITTALS

A. Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Site Inspection: Visit the site and inspect all existing structures. Observe and record any defects which may exist in buildings or structures adjacent to but not directly affected by the demolition work. Provide the City of New York with a copy of this inspection record and obtain the OWNER's approval prior to commencing the demolition.

PART II - PRODUCTS

Not Used

PART III - EXECUTION

3.1 EXAMINATION OF EXISTING DRAWINGS

A. Drawings of existing utilities are included in the civil drawing set.

3.2 PROTECTION

A. General Safety: Provide warning signs, protective barriers, and warning lights as necessary adjacent to the work as approved or required. Maintain these items during the demolition period.

B. Existing Services: Undertake no demolition work until all mechanical and electrical services affected by the work have been properly disconnected. Cap, reroute or reconnect interconnecting piping or electrical services that are to remain in service either permanently or temporarily in a manner that will not interfere with the operation of the remaining facilities.

C. Hazards: Perform testing and air purging where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances is apparent or suspected, and eliminate the hazard before demolition is started.

3.3 DEMOLITION REQUIREMENTS

A. Explosives: The use of explosives will not be permitted.

B. Protection: Carefully protect all mechanical and electrical equipment against dust and debris.

C. Removal: Remove all debris from the structures during demolition and do not allow debris to accumulate in piles.

D. Access: Provide safe access to and egress from all working areas at all times with adequate protection from falling material.

E. Protection: Provide adequate scaffolding, shoring, bracing railings, toe boards and protective covering during demolition to protect personnel and equipment against injury or damage. Cover floor openings not used for material drops with material substantial enough to support any loads placed on it. Properly secure the covers to prevent accidental movement.

F. Lighting: Provide adequate lighting at all times during demolition.

G. Closed Areas: Close areas below demolition work to anyone while removal is in progress.

H. Material Drops: Do not drop any material to any point lying outside the exterior walls of the structure unless the area is effectively protected.

3.4 DISPOSAL OF MATERIALS

A. Final Removal: Remove all debris, rubbish, scrap pieces, equipment, and materials resulting from the demolition unless otherwise indicated. Take title to all demolished materials and remove such items from the site.

B. City of New York's Property: In addition to any items which may be shown, the following items remain the property of the City of New York. Remove carefully, without damage, all items listed or shown, and stockpile as directed.

END OF SECTION 02 41 00

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SECTION 028013 – GENERAL CONTRACTOR WORK

ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

1.01 SCOPE FOR ASBESTOS ABATEMENT WORK

A. The "General Conditions" apply to the work of this Section.

B. The Asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the Asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.

C. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE RULES AND REGULATIONS OF THE ASBESTOS CONTROL PROGRAM AS PROMULGATED BY TITLE 15 CHAPTER I OF RCNY AND NEW YORK STATE DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 56 CITED AS 12 NYCRR, PART 56 WHICHEVER IS MORE STRINGENT AS PER LATEST AMENDMENTS TO THESE LAWS AND AS MODIFIED HEREIN BY THESE SPECIFICATIONS.

D. ALL DISPOSAL OF ASBESTOS CONTAMINATED MATERIAL SHALL BE PER LOCAL LAW 70/85.

E. THE ASBESTOS ABATEMENT CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT CERTAIN METHODS OF ASBESTOS ABATEMENT ARE PROTECTED BY PATENTS. TO DATE, PATENTS HAVE BEEN ISSUED WITH RESPECT TO "NEGATIVE PRESSURE ENCLOSURE" OR "NEGATIVE-AIR" OR "REDUCED PRESSURE" AND "GLOVE BAG".

F. THE ASBESTOS ABATEMENT CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND SHALL HOLD THE DEPARTMENT OF DESIGN AND CONSTRUCTION AND THE CITY HARMLESS FROM ANY AND ALL DAMAGES, LOSSES AND EXPENSES RESULTING FROM ANY INFRINGEMENT BY THE ASBESTOS ABATEMENT CONTRACTOR OF ANY PATENT, INCLUDING BUT NOT LIMITED TO THE PATENTS DESCRIBED ABOVE, USED BY THE ASBESTOS ABATEMENT CONTRACTOR DURING PERFORMANCE OF THIS AGREEMENT.

G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

H. Prior to starting, the Asbestos abatement contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the Work as required by these Specifications. The Asbestos abatement contractor is responsible to prepare and submit all filings, notifications, etc. required by all City, State and Federal regulatory agencies having jurisdiction.

The Asbestos abatement contractor is responsible for submitting the Asbestos Project Notification Form (ACP-7 Form) to the Department of Environmental Protection, Asbestos Control Program, as per Title 15, Chapter I of RCNY and to the NYSDOL as per Industrial Code Rule 56.

The Asbestos abatement contractor is responsible for preparing, and submitting Asbestos Variance Application (ACP-9). If a Variance is required, the Asbestos abatement contractor is responsible to retain a NYSDOL Asbestos Project Designer, as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required variance.

The General contractor is responsible for preparing and submitting an Asbestos Abatement Permit and/or Work Place Safety Plans (WPSP) that may be required for the completion of the Contract or incidental work. If such plans are required, the Asbestos abatement contractor is responsible to retain a NYSDOL Licensed Design Professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The Asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The Asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The Asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

I. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work in other than regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.

J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the Asbestos abatement contractor to pay premium or overtime wages to complete the work. If the Commissioner orders work in other than regular working hours, the Asbestos abatement contractor shall multiply the unit price for that portion of the work requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

A. Requirements: The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (5) below. The asbestos abatement contractor must, submit documentation demonstrating compliance with all listed requirements. Such documentation shall include without limitation, all required licenses, certificates, and documentation.

1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, must demonstrate for the three year period prior to the work, that it has been licensed by the New York State Department of Labor, as an "Asbestos abatement contractor".

2. The asbestos abatement contractor must, for the three year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.

3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must provide evidence of having successfully performed and completed in a timely fashion at least five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least $250,000.00 in each of the three years.

4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work, brief description of the work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.

5. The asbestos abatement contractor must demonstrate that it has the financial resources, supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the

Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract.

B. Insurance Requirements: The asbestos abatement contractor must provide asbestos liability insurance in the following amount: 1 million dollars per occurrence, 2 million dollars aggregate (combined single limit). The City of New York shall be named as an additional insured on such insurance policy.

C. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof.

1.03 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

The Asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above.

In the event that the project is not classified as "urgent" the Asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

A. Name and address of building City or operator;

B. Project description:

1. Size - square feet, number of linear feet, etc.;

2. Age - date of construction and renovations (if known);

3. Use - i.e., office, school, industrial, etc.

4. Scope - repair, demolition, cleaning, etc.

C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;

D. Building location/address, including Block and Lot numbers;

E. Work schedule including the starting and completion dates;

F. Abatement methods to be employed;

G. Procedures for removal of asbestos-containing material;

H. Name, title and authority of governmental representative sponsoring project.

1.04 WORK INCLUDED IN UNIT PRICE

The Asbestos abatement contractor will be paid a basic unit price of **$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR

A. "Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the N1OSH Standard Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.

B. Air monitoring of Asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).

C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.

1.06 THIRD PARTY MONITORING AND LABORATORY

A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.

B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).

C. The Third Party Air Monitoring Firm and the designated Project Monitor shall 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 X 0.65 = 65 sq.ft. 65 x unit price = Payment

100 X 2.62 = 262 sq.ft. 262 x unit price = Payment

B. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER INSULATION:** (all types including Silicate Block and including the removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

EXAMPLE: Item B. removal and replacement of 1000 S.F. of boiler insulation (incl. Silicate block)

1000 S.F. X (1.5) X the Unit Price = Payment

C. **REMOVAL, DISPOSAL AND REPLACEMENT OF TANK INSULATION:** (all types including removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

D. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER UPTAKE, & BREACHING INSULATION:** (all types including stiffening angles and wire lath) Payment shall be made at 2.0 times the unit price per square foot.

E. **REMOVAL, DISPOSAL AND REPLACEMENT OF DUCT INSULATION:** Payment shall be made at 1.0 times the unit price per square foot.

F. **REMOVAL, DISPOSAL AND REPLACEMENT OF SOFT ASBESTOS CONTAINING MATERIAL:** (Including sprayed-on fire proofing and sound proofing) Payment shall be made at 1.0 times the unit price per square foot of surface area. Area of irregular surfaces must be calculated and confirmed with DDC representative.

G. **ACOUSTIC PLASTER REPAIR AND/OR ENCAPSULATION:** Payment shall be made at 0.5 times the unit price per square foot.

H. **PATCHING OR REPAIR** of items listed in A through F will be paid at 0.33 times the unit price per square foot.

I. **REMOVAL, DISPOSAL AND REPLACEMENT OF WATERPROOFING ASBESTOS CONTAINING MATERIAL:** (including friable and non-friable waterproofing material from interior and exterior walls, floors, foundations, penetrations, louvers, vents and openings other than windows, doors and skylights) Payment shall be made at 0.5 times the unit price per square foot.

J. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING ELECTRICAL WIRING INSULATION:** (including friable and non-friable wiring insulation) Payment shall be made at 0.33 times the unit price per square foot.

K. **PAINTING:** Payment shall be made at 0.05 times the unit price per square foot.

L. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING PLASTER:** from ceilings and walls, including any wire lath and disposal as asbestos containing waste. Payment shall be made at 0.80 times the unit price per square foot.

M. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING FLOOR TILES, CEILING TILES, TRANSITE PANELS:** (including any adhesive, glue, mastic and/or underlayment) and disposal as asbestos containing waste. Payment shall be made at 0.40 times the unit price per square foot. If multiple layers are discovered, each additional layer shall be paid at 0.20 times the unit price per square foot.

N. **ADDITIONAL CLEAN UP/HOUSEKEEPING OF WORK AREA:** (excluding pre-cleaning of work area required by regulations) HEPA vacuuming and wet cleaning of asbestos contaminated surface. Payment shall be made at 0.20 times the unit price per square foot. When GLOVE BAG is employed to remove ACM, cost of HEPA vacuuming and wet cleaning of floor area up to 3 feet on each side of glove-bag shall be included in unit price and no extra payment will be made.

O. **REMOVAL, DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL:** including mastic, flashing and sealant compound and provide temporary asbestos-free roof covering consisting of one layer of rolled roofing paper sealed with asphaltic roofing compound. Payment shall be made at 0.8 times the unit price per square foot. Credit at a rate of 0.33 times the unit price will be taken for each square foot of temporary roof covering which the Asbestos abatement contractor is directed not to install.

P. **PICK-UP AND DISPOSAL OF GROSS DEBRIS:** (excluding any waste generated from abatement under Item A-R) at a rate of $150 per cubic yard for asbestos contaminated waste and $75 per cubic yard for non-asbestos contaminated waste. This cost includes all labor and material cost associated with work.

Q. **REMOVAL OF ASBESTOS-CONTAINING BRICK, BLOCK, MORTAR, CEMENT OR CONCRETE:** along with all surfacing materials including wire lath and/or other supporting structures and disposal as ACM waste. Payment shall be made at a rate of $25.00 per cubic foot of material removed.

R. **REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING WINDOW/DOOR CAULKING:** including friable and non-friable caulking, weather-stripping, glazing, sealants or other waterproofing materials applied to windows, doors, skylights, etc. Payment shall be made at the rate of $400.00 per opening regardless of size or configuration. This cost includes labor, consumable materials, set-up/breakdown, removal and disposal, as required.

Note 1: CREDIT: For items listed in A through F, a credit at a rate of 0.33 times the unit price, times the respective multiplier (for each item) will be taken for each square foot of insulation which the asbestos abatement contractor is not directed to reapply.

Note 2: MINIMUM PAYMENT: The minimum payment per call at any individual job sites or various job sites during the same day will be eight hundred dollars ($800.00).

Note 3: All payments shall be made as described in paragraph 1.09 herein.

Note 4: WORKING HIGHER THAN 12 FEET ABOVE FLOOR LEVEL OR WORK REQUIRING COMPLEX SCAFFOLDING OR CONSTRUCTION WORK PLATFORMS: Provisions are made in this Contract to compensate the Asbestos abatement contractor for work performed in locations that are difficult to access due to work at elevations that are significantly higher than the normal work level. The unit price for these items will be paid at 1.20 times the unit price described in Paragraphs 1.09, A through R for those portions of the work that are more than twelve (12) feet above the grade for that would be judged as the normal working level.

1.10 GUARANTEE

A. Work performed in compliance with each task shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.

B. The Commissioner of The Department of Design and Construction will notify the Asbestos abatement contractor in writing regarding defects in work under the guarantee.

1.11 OCCUPANCY OF SITE NOT EXCLUSIVE

Attention is specifically drawn to the fact that contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the Asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may be brought upon any site of the work of this Contract. This paragraph applies to those areas outside the regulated Work Area as defined by Title 15, Chapter I of RCNY.

1.12 SUBMITTALS

A. Pre-Construction Submittals:

1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the Asbestos abatement contractor shall present three copies of the following items:

   a. Asbestos abatement contractor's scope of work, work plan and schedule.

b. Asbestos project notifications, approved variances and plans to Government Agencies.

c. Copies of Permits, clearance and licenses if required.

d. Schedules: the Asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:

(1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

(2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.

(3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.

e. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number to nearest hospital) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

f. Material Safety Data Sheets (MSDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.

g. Worker Training and Medical Surveillance: The Asbestos abatement contractor shall submit a list of the persons who will be employed by him /her to perform the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.

h. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

(1) The Asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of the Asbestos abatement contractor; name, address and phone number of Asbestos abatement contractor and City's third party air monitoring firm; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved for entry into the Work Area.

(2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

i. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

B. During Construction Submittals:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.

2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.

3. Floor plans indicating Asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager.

4. All Asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the Asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from Asbestos abatement contractor, Sub-Asbestos abatement contractors and Suppliers,

2. Daily OSHA air monitoring results,

3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,

4. Field Sign-In/Sign-Out Logs for every shift,

5. Copies of all Building Department Forms and Permits,

6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,

7. All Warranties as stated in the Specifications,

    a. Fully executed disposal certificates and transportation manifest.

8. Project Record: The Asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:

    a. Copies of licenses of all asbestos abatement contractors involved in the project;

    b. Copies of NYCDEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;

    c. Copies of all project notifications and reports filed with NYCDEP, NYSDOL and USEPA for the project, with any amendments or variances;

    d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;

    e. A copy of the air sampling log and all air sampling results;

f. A copy of the abatement asbestos abatement contractor's daily log book;

g. Copies of all asbestos waste manifests;

h. A copy of all Project Monitor's Reports (ACP-15).

i. A copy of each ATR-1 Form completed for the asbestos project (if required).

j. A copy of each Asbestos Project Conditional Closeout Report (ACP-20) if required.

k. A copy of the Asbestos Project Completion Form (ACP-21).

1.13 PROTECTION OF FURNITURE AND EQUIPMENT

Cover all furniture and equipment that cannot be removed from Work Areas. Movable furniture and equipment will be removed from Work Areas by the Asbestos abatement contractor prior to start of work. At the conclusion of the work (after final air testing), the Asbestos abatement contractor will remove all plastic covering on walls, floors, furniture, equipment and reinstall furniture and equipment. He shall remove and store all sheaths, curtains and drapes, and reinstall same following final clean up.

1.14 UTILITIES

A. General:

All temporary facilities shall be subject to the approval of the Commissioner. Prior to starting work at any site, locations and/or sketches (if required) of temporary facilities must be submitted to the Construction Project Manager for the required approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the Asbestos abatement contractor in buildings under their jurisdiction. However, it is the responsibility of the Asbestos abatement contractor to ensure that hot water is provided for showering in the decontamination unit.

The Asbestos abatement contractor shall furnish, install and maintain any needed equipment to meet these requirements at his own expense.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the Asbestos abatement contractor in a building, under

their jurisdiction. The Asbestos abatement contractor is responsible for routing the electric power to the abatement Work Area.

All temporary lighting and temporary electrical service for Work Area shall be in weatherproof enclosures and be ground fault protected.

D. In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the Asbestos abatement contractor. However, it is the Asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

1.15 FEES

The Asbestos abatement contractor shall be responsible for any and all fees or charges imposed by Local, State or Federal Law, Rule and Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

END OF SECTION

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART I - GENERAL

1.1 RELATED DOCUMENT:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes precast or cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Precast Concrete
2. Structural cast in place concrete – all applications, unless noted otherwise
3. Structural foundations and walls greater or equal to 18" thick
4. Thrust blocks, unreinforced encasement, working mats

B. Related Sections:

1. Section 32 13 13 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data: For each type of product indicated.

C. Design Mixtures: Mixture proportions for each concrete design mixture shall conform to the requirements of the New York City Administrative Building Code and this Specification for water/cement ratio, cement content, slump, maximum size of coarse aggregates, air content,

admixtures, and chloride concentrations, as well as compressive strength. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Commissioner.

F. Concrete delivery tickets containing all information specified in ASTM C94 Section 16.1.

1.5 INFORMATIONAL SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Curing compounds.
7. Bonding agents.
8. Adhesives.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

1.6 QUALITY ASSURANCE

A. General: Comply with all New York City Building Code requirements for construction, inspection and testing.

B. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

D. Testing Agency Qualifications: An independent agency, licensed by the New York City Department of Building and qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2, Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

E. 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.

F. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

G. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

H. 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.

I. Pre-installation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.

b. Independent testing agency responsible for concrete design mixtures.

c. Ready-mix concrete manufacturer.

d. Concrete subcontractor.

e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART II - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

   a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

F. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

G. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

C. Welding: When required or permitted, all welding of reinforcing bars shall conform to ANSI/AWS D1.4. Unless otherwise permitted by Commissioner, welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.

D. Temperature Reinforcing: Unless otherwise shown on the Contract Drawings or in the absence of the concrete temperature reinforcing being shown:

1. The minimum cross sectional area of horizontal and vertical concrete temperature reinforcing in wall shall be 0.0033 times the gross concrete area.

2. The minimum cross sectional area of temperature reinforcing perpendicular to the principal reinforcing in slabs shall be 0.0020 times the gross concrete area.

3. Temperature reinforcing shall not be placed further apart than five times the slab or wall thickness nor more than 18 inches.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type II, gray. Supplement with the following:

a. Fly Ash: ASTM C 618, Class F

b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica. Silica fume shall be the dry compacted or slurry form, to be considered as cementitious material. Application rate shall be 7 percent by weight of cement, unless indicated otherwise.

C. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 3 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials. Coarse aggregates shall be crushed stone processed from natural rock or stone and shall consist of clean, hard, strong, durable, insoluble, unweathered, and uncoated pieces of uniform quality throughout; and shall be free from such alkali, decomposed minerals, organic material, clay, mica, schist, or other foreign matter that will render it unsuitable. Use of slag and pit or bank run gravel is not permitted.

1. Maximum Coarse-Aggregate Size: See mix design criteria.

2. Fine Aggregate: Fine aggregates shall be composed of clean, sharp, hard, strong, durable, insoluble, uncoated natural sand free from loam, clay lumps or other materials with deleterious reactivity to alkali in cement. Dune sand, bank run and manufactured sand are not acceptable.

3. Do not use aggregates containing soluble salts or other substances such as iron sulfide, pyrite, marcscite, ochre, or other materials that can cause stains on exposed concrete surface

D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A,

2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Axim Italcementi Group, Inc.; CATEXOL CN-CI.

b. BASF Construction Chemicals - Building Systems; Rheocrete CNI.

c. Euclid Chemical Company (The), an RPM company; EUCON CIA.

d. Or approved equal

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

1. Products: Subject to compliance with requirements, provide one of the following:

a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.

b. Grace Construction Products, W. R. Grace & Co.; DCI-S.

c. Sika Corporation; FerroGard 901.

d. Or approved equal.

E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ChemMasters.

b. Davis Colors.

c. Dayton Superior Corporation.

d. Hoover Color Corporation.

e. Lambert Corporation.

f. QC Construction Products.

g. Rockwood Pigments NA, Inc.

h. Scofield, L. M. Company.

i. Solomon Colors, Inc.

j. Or approved equal.

2. Color: As selected by Commissioner from manufacturer's full range.

2.6 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Greenstreak.

   b. Vinylex Corp.

   c. Or approved equal

2. Profile: Ribbed with center bulb at expansion joints or Ribbed without center bulb at construction joints.

3. Dimensions: 6 inches by 3/8 inch thick at construction joints or 9 inches by 3/8 inch thick at expansion joints; nontapered.

B. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.

1. Products: Subject to compliance with requirements, provide one of the following :

   a. Adeka Ultra Seal/OCM, Inc.; Adeka Ultra Seal.

   b. Greenstreak; Hydrotite.

   c. Vinylex Corp.; Swellseal.

   d. Or approved equal

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, provide one of the following :

   a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.

   b. BASF Construction Chemicals - Building Systems; Confilm.Sika Corporation; SikaFilm.

   c. Or approved equal

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, provide one of the following :

a. BASF Construction Chemicals - Building Systems; Kure 200.

b. ChemMasters; Safe-Cure Clear.

c. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.

d. Or improved equal

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

A. Concrete repair mortar: A prepackaged polymer-modified cementitious repair mortar with following minimum properties.

1. Compressive strength at one day: 2000 psi (ASTM C109).

2. Compressive strength at 28 day: 6000 psi (ASTM C109).

3. Bond strength at 28 day: 1800 psi (ASTM C 882 modified).

B. Concrete repair mortar shall be one of the following:.

1. Five Star Structural Concrete, manufactured by Five Star Products, Inc. The formulation recommended by the manufacturer for the specific applications shall be used..

2. SikaTop 122 Plus, SikaTop 123 Plus, SikaTop 111 Plus, or Sikacem 133, manufactured by the Sika Corporation. The formulation, among those listed, recommended by the manufacturer for the specific application conditions shall be used..

3. Emaco S88-CA or S66-CR, manufactured by Master Builders, Inc. The formulation, among those listed, recommended by the manufacturer for the specific application conditions shall be used.

C. Cement patching mortar shall consist of a mix of 1 part cement to 1½ parts fine aggregate passing a No. 16 sieve with sufficient water to form a trowelable consistency. Minimum compressive strength at 28 days shall be 5000 psi. Where required to match the color of adjacent concrete surfaces, white portland cement shall be blended with standard portland cement so that, when dry, the patching mortar shall match the color of the surrounding concrete.

D. Crack Injection Materials:

1. Epoxy: Low viscosity, high modulus moisture insensitive type. It shall be:

a. Sikadur 35, Hi-Mod L.V. and Sikadur 31, Hi-Mod Gel, as manufactured by Sika Corporation.

b. Eucopoxy Injection Resin, as manufactured by the Euclid Chemical Company.

c. Or approved equal.

2. Hydrophilic Resin: Acrylic-ester based resin with a maximum viscosity of 50 cps, cured into a rubber-like material which has the potential for unrestrained increase in volume in excess of 100 percent in the presence of water. It shall be:

a. Duroseal Inject, as manufactured by BBZ USA, Inc.

b. Sika Injection 29, by Sika Corporation.

c. Or approved equal.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash: 20 percent.

2. Combined Fly Ash and Pozzolan: 25 percent.

3. Ground Granulated Blast-Furnace Slag: 40 percent.

4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent Portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

5. Silica Fume: 10 percent.

6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.05 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.11 CONCRETE MIXTURES FOR STRUCTURAL ELEMENTS

A. Precast Concrete: Proportion normal-weight concrete mixture as follows:

1. Cement: Type III

2. Minimum Compressive Strength: 5000 psi at 28 days.

3. ¾-inch maximum aggregate

4. Maximum Water-Cementitious Materials Ratio: 0.42.

5. Minimum cement content: 705 lbs/yd

6. Air Content: 6 percent, plus or minus 1 percent at point of delivery for ¾-inch nominal maximum aggregate size.

B. Structural – all applications, unless noted otherwise: Proportion normal-weight concrete mixture as follows:

1. Cement: Type II

2. Minimum Compressive Strength 5000 psi at 28 days.

3. 1-inch maximum aggregate

4. Maximum Water-Cementitious Materials Ratio: 0.42.

5. Minimum cement content: 660 lbs/yd

6. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

7. Air Content: 6 percent, plus or minus 1 percent at point of delivery for 1-inch nominal maximum aggregate size.

C. Structural foundations and walls greater or equal to 18" thick: Proportion normal-weight concrete mixture as follows:

1. Cement: Type II

2. Minimum Compressive Strength: 5000 psi at 28 days.

3. 1-1/2-inch maximum aggregate

4. Maximum Water-Cementitious Materials Ratio: 0.42.

5. Minimum cement content: 610 lbs/yd

6. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch

7. Air Content: 5.5 percent, plus or minus 1 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.

D. Thrust blocks, unreinforced encasement, working mats: Proportion normal-weight concrete mixture as follows:

1. Cement: Type II

2. Minimum Compressive Strength: 3000 psi at 28 days.

3. ¾-inch or 1-inch maximum aggregate

4. Maximum Water-Cementitious Materials Ratio: 0.60.

5. Minimum cement content: 376 lbs/yd

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART III - EXECUTION

3.1 FORMWORK

A. Erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.

2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork shall be removed in accordance with ACI 347 recommendations without damage to concrete and in a manner to insure complete safety to the structure. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 48 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Commissioner.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Commissioner.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls 40 feet. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 2" of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.7 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Commissioner.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: Concrete shall be cast against forms constructed of plywood not less than 5/8 inch thick, or of boards lined with hardboard not less than 3/16 inch thick, or other approved materials. Form material shall not have torn grain, worn edges, patches of holes from previous use, or other defects which would impair the texture of the concrete surface. As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Commissioner before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.

2. Construct concrete bases 8 inches (200 mm) high unless otherwise indicated; and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.

3. Minimum Compressive Strength: 4500 psi (31 MPa) at 28 days.

4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.

5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete substrate.

6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

D. Dowel Adhesive System:

1. Where shown on the Contract Drawings, reinforcing bars anchored into hardened concrete with a dowel adhesive system shall use a two-component adhesive mix which shall be injected with a static mixing nozzle following manufacturer's instructions.

2. The embedment depth of the bar shall be per manufacturer's recommendations, so as to provide a minimum allowable bond strength that is equal to 125 percent of the yield strength of the bar, unless noted otherwise on the Contract Drawings.

3. The adhesive system shall be HIT HY-150 Injection Adhesive Anchor System manufactured by Hilti, Inc.; Epcon System manufactured by ITW Ramset/Redhead; Sikdur Injection Gel manufactured by Sika Corp. or approved equal.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.

   b. Continuous water-fog spray.

   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less

than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Commissioner. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Cracks: Repair non-structural cracks greater than 0.010 inch in width and any structural crack in concrete as defined by Commissioner.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than ¼ inch deep or extending more than 1/2 inch in any dimension to solid concrete. Limit cut depth to less than 1 inch for cement mortar and ½ inch for repair mortar. Make edges of cuts perpendicular to concrete surface. Before placing the cement mortar, thoroughly clean and brush-coat the area to be patched with the specified bonding agent. Where concrete repair mortar is used, the surface shall be prepared and mortar placed per manufacturer's recommendations. Compact mortar in place and strike off slightly higher than the surrounding surface. Cure as specified. .

2. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent. Repair defects on surfaces exposed to view by blending white portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Commissioner.

4. Repair structural cracks by pressure-grouting with epoxy injection in accordance with manufacturer's directions and recommendations.

5. Repair non-structural cracks by pressure-grouting with hydrophilic resin in accordance with manufacturer's directions and recommendations.

6. Remove stains, grout accumulations, sealing compounds, and other substances marring surfaces by rubbing, powerwashing, or abrasive blast using sand finer then No. 30 and air pressure from 15 to 25 psi.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing, non-structural cracks wider than 0.01 inch or structural cracks of any width as defined by the Commissioner.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. When the concrete has already set and repairs are required, sawcut around the perimeter of the area to be repaired to a ½ inch depth and remove concrete so that the minimum thickness of the repair is ½ inch. Apply

specified concrete repair mortar in accordance with the manufacturer's directions and recommendations

4. Repair defective areas, except cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts to a minimum depth of 1.5 inch and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

5. Repair isolated random non-structural cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

6. Repair structural cracks by pressure-grouting with epoxy injection in accordance with manufacturer's directions and recommendations.

E. Perform structural repairs of concrete, subject to Commissioner's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Commissioner's approval.

3.15 FIELD QUALITY CONTROL

A. Inspections:

1. Steel reinforcement placement.

2. Steel reinforcement welding.

3. Headed bolts and studs.

4. Verification of use of required design mixture. Secure production samples of materials at plants or stockpiles during the course of the work and test for compliance wth the specifications.

5. Concrete placement, including conveying and depositing. Sample concrete at point of placement. Properly record the time of day when all tests were made and the corresponding results. Also record from what truckloads the samples were taken, the class of concrete which the samples represent and exactly where the concrete represented by the sample was deposited in the structure.

6. Curing procedures and maintenance of curing temperature.

7. Verification of concrete strength before removal of shores and forms from beams and slabs.

B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: As a minimum, perform the number of concrete testing as follows. When the total cubic yards of concrete placed during a day is 100 cu. yd. or less, make one strength test for each 50 cu. yd, or fraction thereof for each concrete mixture. When total cubic yards of concrete placed during a day exceeds 100 cu. yd., make one strength test for each 100 cu. yd, or fraction thereof for each concrete mixture.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.

5. Water content testing shall be conducted in accordance with AASHTO TP23.

6. Compression Test Specimens: ASTM C 31/C 31M.

   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

10. Test results shall be reported in writing to Commissioner, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Commissioner but will not be used as sole basis for approval or rejection of concrete.

12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Commissioner. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Commissioner.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

D. Perform all other inspections and field testings of concrete as required by the New York City Building Code.

E. Contractor shall correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

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SECTION 03 33 00

ARCHITECTURAL CONCRETE

PART I - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes cast-in-place architectural concrete including form facings, reinforcement accessories, concrete materials, concrete mixture design, placement procedures, and finishes. Include exposed aggregate finish as part of the work.

B. Related Sections:

1. Section 32 13 13 "Concrete Paving" for concrete pavement and flatwork finishes.

2. Section 03 30 00 "Cast-in-place Concrete ".

1.3 DEFINITIONS

A. Cast-in-Place Architectural Concrete: Formed concrete that is exposed to view on surfaces of completed structure or building and that requires special concrete materials, formwork, placement, or finishes to obtain specified architectural appearance.

B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

C. Design Reference Sample: Sample designated by the Commissioner in the Contract Documents that reflects acceptable surface quality and appearance of cast-in-place architectural concrete.

D. Reveal: Projection of coarse aggregate from matrix or mortar after completion of exposure operations.

1.4 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place architectural concrete to attend, including the following:

   a. Contractor's superintendent.

   b. Independent testing agency responsible for concrete design mixtures.

   c. Ready-mix concrete manufacturer.

   d. Cast-in-place architectural concrete subcontractor.

2. Review concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction joints, forms and form-removal limitations, reinforcement accessory installation, concrete repair procedures, and protection of cast-in-place architectural concrete.

1.5 ACTION SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data: For each type of product.

C. Design Mixtures: Mixture proportions for each concrete design mixture shall conform to the requirements of the New York City Administrative Building Code and this Specification for water/cement ratio, cement content, slump, maximum size of coarse aggregates, air content, admixtures, and chloride concentrations, as well as compressive strength. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

D. Formwork Shop Drawings: Show formwork construction including form-facing joints, rustications, construction and contraction joints, form joint-sealant details, form tie locations and patterns, inserts and embedments, cutouts, cleanout panels, and other items that visually affect cast-in-place architectural concrete.

E. Placement Schedule: Submit concrete placement schedule before start of placement operations. Include locations of all joints including construction joints.

F. Samples: For each of the following materials:

1. Form-facing panel.

2. Form ties.

3. Coarse- and fine-aggregate gradations.

G. Samples for Verification: Architectural concrete Samples, cast vertically, approximately 18 by 18 by 2 inches (450 by 450 by 50 mm), of finishes, colors, and textures to match design reference sample. Include Sample sets showing the full range of variations expected in these characteristics.

H. Samples of aggregate for exposed aggregate finish should be submitted and approved before mock-up panels are constructed.

1.6 INFORMATIONAL SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions,

B. Qualification Data: For manufacturer and testing agency.

C. Material Certificates: For each of the following:

1. Cementitious materials.

2. Admixtures.

3. Form materials and form-release agents.

4. Repair materials.

D. Material Test Reports: For the following, by a qualified testing agency:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

1.7 QUALITY ASSURANCE

A. General: Comply with all New York City Building Code requirements for construction, inspection and testing.

B. Installer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "NRMCA Quality Control Manual - Section 3, Certification of Ready Mixed Concrete Production Facilities."

2. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work

C. Testing Agency Qualifications: An independent agency, licensed by the New York City Department of Building and qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

2. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations for Cast-in-Place Architectural Concrete: Obtain each color, size, type, and variety of concrete material and concrete mixture from single manufacturer with resources to provide cast-in-place architectural concrete of consistent quality in appearance and physical properties.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5 and Section 6, "Architectural Concrete."

2. ACI 303.1, "Specification for Cast-in-Place Architectural Concrete."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Field Sample Panels: After approval of verification sample and before casting architectural concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, cast vertically, approximately 48 by 48 by 6 inches (1200 by 1200 by 150 mm) minimum, to demonstrate the expected range of finish, color, and texture variations.

1. Locate panels as indicated or, if not indicated, as directed by the Commissioner.

2. Demonstrate methods of curing, aggregate exposure, sealers, and coatings, as applicable.

3. In presence of the Commissioner, damage part of an exposed-face surface for each finish, color, and texture, and demonstrate materials and techniques proposed for repair of tie holes and surface blemishes to match adjacent undamaged surfaces.

4. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.

5. Demolish and remove field sample panels when directed.

H. Mockups: Before casting architectural concrete, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by the Commissioner.

2. Build mockups of typical exterior wall of cast-in-place architectural concrete as shown on Drawings.

3. Demonstrate curing, cleaning, and protecting of cast-in-place architectural concrete, finishes, and contraction joints, as applicable.

4. In presence of the Commissioner, damage part of the exposed-face surface for each finish, color, and texture, and demonstrate materials and techniques proposed for repair of tie holes and surface blemishes to match adjacent undamaged surfaces.

5. Obtain the Commissioner's approval of mockups before casting architectural concrete.

6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART II - PRODUCTS

2.1 FORM-FACING MATERIALS

A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" for formwork and other form-facing material requirements.

B. Form-Facing Panels for Finishes: Steel, glass-fiber-reinforced plastic, or other approved nonabsorptive panel materials that will provide continuous, true, and smooth architectural concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

C. Chamfer Strips: Metal, rigid plastic, elastomeric rubber, or dressed wood, 3/4 by 3/4 inch (19 by 19 mm), minimum; nonstaining; in longest practicable lengths.

D. Form Joint Tape: Compressible foam tape; pressure sensitive; AAMA 800, "Specification 810.1, Expanded Cellular Glazing Tape"; minimum 1/4 inch (6 mm) thick.

E. Form Joint Sealant: Elastomeric sealant complying with ASTM C 920, Type M or Type S, Grade NS that adheres to form joint substrates.

F. Form-Release Agent: Commercially formulated, colorless form-release agent that will not bond with, stain, or adversely affect architectural concrete surfaces and will not impair subsequent treatments of those surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

G. Surface Retarder: Chemical liquid set retarder, for application on form-facing materials, capable of temporarily delaying final hardening of newly placed concrete surface to depth of reveal specified.

1. Surface retarder for exposed aggregate formwork shall be:
   a. "MasterFinish HV" as manufactured by Master Builder, Inc., Lexington, KY
   b. "Concrete Surface Retarder Formula F or S" as manufactured by Euclid Chemical Co., Cleveland, OH
   c. "Sika Rugasol-S" as manufactured by Sika Corporation, Lyndhurst, NJ
   d. Or approved equal.

H. Form Ties: Factory-fabricated, glass-fiber-reinforced plastic ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish glass-fiber-reinforced plastic ties, not less than 1/2 inch (13 mm) in diameter, of color selected by the Commissioner from manufacturer's full range.

2. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT AND ACCESSORIES

A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" for steel reinforcement and other requirements for reinforcement accessories.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire fabric in place; manufacture according to CRSI's "Manual of Standard Practice."

1. Where legs of wire bar supports contact forms, use gray, all-plastic bar supports.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type II , gray . Supplement with the following:

   a. Fly Ash: ASTM C 618, Class C.

   b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or Grade 120.

c. Silica Fume: ASTM C 1240, amorphous silica.

B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate or better, graded. Provide aggregates from single source with documented service record data of at least 3 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials. Coarse aggregates shall be crushed stone processed from natural rock or stone and shall consist of clean, hard, strong, durable, insoluble, unweathered, and uncoated pieces of uniform quality throughout; and shall be free from such alkali, decomposed minerals, organic material, clay, mica, schist, or other foreign matter that will render it unsuitable. Use of slag and pit or bank run gravel is not permitted

1. Maximum Coarse-Aggregate Size: 1 inch.

2. Fine Aggregate: Fine aggregates shall be composed of clean, sharp, hard, strong, durable, insoluble, uncoated natural sand free from loam, clay lumps or other materials with deleterious reactivity to alkali in cement. Dune sand, bank run and manufactured sand are not acceptable.

3. Gradation: Uniformly graded.

4. Do not use aggregates containing soluble salts or other substances such as iron sulfide, pyrite, marcscite, ochre, or other materials that can cause stains on exposed concrete surface.

5. Concrete items specified with exposed aggregate finish on contract drawings shall be constructed of concrete mix utilizing aggregates made from the dolomite bluestone from:
   a. Tilcon Clinton Point Quarry, New Hamburg, NY. Phone: 845-297-3764.
   b. Cobleskill Stone Products, Cobleskill, NY. Phone: 518-234-0021.
   c. Schofield Stone, Bridgewater, NJ. Phone: 800-827-6257.
   d. Or approved equal.

C. Water: Potable, complying with ASTM C 94/C 94M except free of wash water from mixer washout operations.

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

1. For concrete indicated to be sealed, curing compound shall be compatible with sealer.

2.6 REPAIR MATERIALS

A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" for repair materials.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

1. Types I and II, non-load bearing Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.7 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of cast-in-place architectural concrete proportioned on basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed design mixtures based on laboratory trial mixtures.

B. Proportion concrete mixtures as follows:

1. Cement: Type II

2. Minimum Compressive Strength (28 Days): 5000 psi (34.5 MPa).

3. Maximum Water-Cementitious Materials Ratio: 0.42.

4. Minimum cement content: 660 lbs/yd (327 kg/m).

5. Slump Limit: 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

6. Air Content: 6 percent, plus or minus 1 percent at point of delivery for 1-inch (25-mm) nominal maximum aggregate size.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

2.8 CONCRETE MIXING

A. Ready-Mixed or Site-Mixed Architectural Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.

1. Clean equipment used to mix and deliver cast-in-place architectural concrete to prevent contamination from other concrete.

2. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART III - EXECUTION

3.1 FORMWORK

A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" for formwork, embedded items, and shoring and reshoring.

B. Limit deflection of form-facing panels to not exceed ACI 303.1 requirements.

C. In addition to ACI 303.1 limits on form-facing panel deflection, limit cast-in-place architectural concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) Class B, 1/4 inch (6 mm).

D. Fabricate forms to result in cast-in-place architectural concrete that complies with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-in-place surfaces. Provide

top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood rustications, keyways, reglets, recesses, and the like, for easy removal.

1. Seal form joints and penetrations at form ties with form joint tape or form joint sealant to prevent cement paste leakage.

2. Do not use rust-stained steel form-facing material.

F. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

G. Chamfer exterior corners and edges of cast-in-place architectural concrete.

H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

L. Coat contact surfaces of forms with surface retarder, according to manufacturer's written instructions, before placing reinforcement.

3.2 REINFORCEMENT AND INSERTS

A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" for fabricating and installing steel reinforcement. Securely fasten steel reinforcement and wire ties against shifting during concrete placement.

B. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.3 REMOVING AND REUSING FORMS

A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Schedule form removal to maintain surface appearance that matches approved mockups.

2. Cut off and grind glass-fiber-reinforced plastic form ties flush with surface of concrete.

B. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of 28-day design compressive strength. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

C. Clean and repair surfaces of forms to be reused in the Work. Do not use split, frayed, delaminated, or otherwise damaged form-facing material. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for cast-in-place architectural concrete surfaces.

3.4 JOINTS

A. Construction Joints: Install construction joints true to line with faces perpendicular to surface plane of cast-in-place architectural concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Commissioner.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.

2. Form keyed joints as indicated. Align construction joint within rustications attached to form-facing material.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

6. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

B. Contraction Joints: Form weakened-plane contraction joints true to line with faces perpendicular to surface plane of cast-in-place architectural concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Commissioner.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, form-release agent, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by the Commissioner.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously between construction joints. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 303.1.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. Do not permit vibrators to contact forms.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents.

4. Do not use chemical accelerators unless otherwise specified and approved in design mixtures.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.6 FINISHES, GENERAL

A. Architectural Concrete Finish: Match the Commissioner's design reference sample, identified and described as indicated, to satisfaction of the Commissioner.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.

1. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

C. Maintain uniformity of special finishes over construction joints unless otherwise indicated.

3.7 EXPOSED-AGGREGATE FINISHES

A. Exposed Aggregate Formwork - Apply surface retarder to formwork in a thin, uniform coat by brush, spray or roller at a rate of 200 square feet per gallon conforming to manufacturer's recommendations.

B. Exposed Aggregate Formwork Removal - The Contractor shall wash concrete surface the same work day that the forms are removed. Immediately after removal of formwork, wash concrete surfaces with water and scrub with stiff bristle brush to match approved mock-up panel.

3.8 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

B. Begin curing cast-in-place architectural concrete immediately after removing forms from concrete. Cure according to ACI 308.1, by one or a combination of the following methods that will not mottle, discolor, or stain concrete:

1. Moisture Curing: Keep exposed surfaces of cast-in-place architectural concrete continuously moist for no fewer 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 (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for no fewer than seven days. Immediately repair any holes or tears during curing period; use cover material and waterproof tape.

3. Curing Compound: Mist concrete surfaces with water. Apply curing compound uniformly in continuous operation by power spray or roller according to manufacturer's written instructions: Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 FIELD QUALITY CONTROL

A. General: Comply with field quality-control requirements in Section 03 30 00 "Cast-in-Place Concrete."

3.10 REPAIRS, PROTECTION, AND CLEANING

A. Comply with Section 03 30 00 "Cast-in-Place Concrete" for Concrete Surface Repairs.

B. Repair and cure damaged finished surfaces of cast-in-place architectural concrete when approved by the Commissioner. Match repairs to color, texture, and uniformity of surrounding surfaces and to repairs on approved mockups.

1. Remove and replace cast-in-place architectural concrete that cannot be repaired and cured to the Commissioner's approval.

C. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.

D. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

E. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris.

F. Wash and rinse surfaces according to concrete finish applicator's written instructions. Protect other Work from staining or damage due to cleaning operations.

1. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

END OF SECTION 03 33 00

SECTION 03 45 00
PRECAST ARCHITECTURAL CONCRETE

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. Related Work specified in other sections includes, but is not limited to, the following:

1. Specification 03 30 00 - Cast-In-Place Concrete

2. Specification 03 33 00 - Architectural Concrete

1.2 SECTION INCLUDES

A. Precast architectural concrete as specified herein shall include precast concrete wall panels, copings, and all accessories necessary.

B. Precast architectural concrete wall panels shall be provided where shown on the Contract Drawings or as required for a complete installation.

1.3 REFERENCES

A. Building Code of the City of New York

B. AC1 318 - Building Code Requirements for Reinforced Concrete

C. ASTM A325 - Specification for Structural Bolts, Steel, Heat Treated, 120/105 ks: Minimum Tensile Strength

D. ASTM A276 - Specification for Stainless and Heat-Resisting Steel Bars and Shapes

E. ASTM A416 - Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

F. ASTM A615/A615M - Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement

G. ASTM A666 - Specification for Austenitic Stainless Steel, Sheet, Strip, Plate and Flat Bar for Structural Application

H. ASTM C33 - Specification for Concrete Aggregates

I.	ASTM C109	-	Test Method for Compressive Strength of Hydraulic Cement Mortars
J.	ASTM C138	-	Test method for Unit Weight, Yield, and Air Content of Concrete
K.	ASTM C150	-	Specification for Portland Cement
L.	ASTM C185	-	Test Method for Air Content of Hydraulic Cement Mortar
M.	ASTM C191	-	Test Method for Tensile Strength of Hydraulic Cement Mortars
N.	ASTM C260	-	Specification for Air-Entraining Admixtures for Concrete
O.	ASTM C330	-	Standard Specification for Lightweight Aggregates for Structural Concrete
P.	ASTM C494	-	Specification for Chemical Admixtures for Concrete
Q.	AASHTO	-	Section 9 of AASHTO Standard Specifications For Highway Bridges
R.	PCI MNL 117	-	Precast/Prestressed Concrete Institute, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products"
S.	PCI MNL 120	-	Precast/Prestressed Concrete Institute "Manual for PCI Design Handbook," latest edition

1.4 PERFORMANCE REQUIREMENTS

A. Load Calculations: Precast units shall be detailed and fabricated to withstand loads as calculated in accordance with the Building Code of the City of New York, and erection forces. Structural properties of the units shall be calculated in accordance with ACI 318.

B. Dimensions and Tolerances: Precast units shall be fabricated to dimensional tolerances in accordance with PCI-MNL-120. Units shall be designed to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

1.5 SUBMITTALS

A. The Contractor shall prepare and submit for approval catalog cuts, drawings, and reference materials in accordance with the requirements in the General Conditions.

1. Working Drawings: Placing drawings shall be submitted, including checked Working Drawings for manufacture and erection of precast wall panels and copings and shall indicate:

a. Unit shapes, including elevations and sections, member piece marks and dimensions

b. Plans and elevations locating and defining all products furnished by the manufacturer

c. Finishes

d. Relationship to adjacent materials

e. Reinforcement, joint and connection details

f. Erection sequence and handling requirements

g. Lifting and erection inserts

h. All dead, live and applicable loads used in the design

i. Location, dimensional tolerances, and details of anchorage devices that are embedded in or attached to structure or other construction

j. Other items cast into panels

k. Handling procedures, plans and/or elevations showing panel location and sequence of erection for special conditions

B. Samples: The following shall be submitted:

1. Samples shall be representative of finished exposed face showing typical range of color and texture. Samples shall be submitted and approved prior to commencement of manufacture.

a. Sample size: 12 inches by 12 inches by thickness indicated on the Contract Drawings, representative of the proposed finished product

C. Quality Control Submittals: The following items shall be submitted:

1. Concrete mix designs

2. Test reports for laboratory cured concrete cylinders

3. Air content tests in accordance with ASTM C 138 submitted with mix design

4. Independent laboratory tests showing that grout is nonshrink at various ages and shows no expansion after set when tested in accordance with ASTM C109, and has a placement time based on initial set of not less than 60 minutes when tested in accordance with ASTM C191. Grout exposed to the weather shall be free of discoloration and shall not require special surface treatments.

5. Design calculations for wall panels and coping prepared and sealed by a Professional Engineer licensed in the State of New York.

1.6 QUALIFICATIONS

A. A qualified manufacturer and erector shall provide precast concrete in accordance with PCI-MNL-117.

1.7 DELIVERY, STORAGE AND HANDLING

A. All precast architectural concrete materials and appurtenances shall be properly protected in accordance with the manufacturer's requirements so that no damage or deterioration will occur from the time of shipment until installation is completed. All products and materials shall be delivered, stored and handled as follows:

1. Delivery: All precast concrete units shall be delivered to the project site in such quantities and at such times to maintain continuity of erection.

2. Orientation During Transport: Units shall be handled and transported in a position consistent with their shape and design in order to avoid stresses which could cause cracking or damage.

3. Equipment and Personnel: Transportation, site handling and erection shall be accomplished using acceptable equipment and methods by qualified personnel so that units shall not be damaged.

4. Lifting: Units shall be lifted or supported only at the points shown on the Working Drawings.

5. Spacers: Nonstaining resilient spacers of even thickness shall be placed between each unit.

6. Support: Units shall be supported during shipment and storage on nonstaining shock-absorbing material.

7. Storage: Units shall be stored and protected so as to prevent contact with soil, staining, or physical damage.

   a. Units shall be stored on firm, level, and smooth surfaces to prevent cracking, distortion, warping or other physical damage.

   b. Stored units shall be placed so that identification marks are discernible, and so that product can be inspected.

   c. Units shall not be placed directly on ground.

   d. Stacked precast units shall be separated by battens across full width of each bearing point.

   e. The top of tier stack shall not be used as storage.

B. Factory assembled parts and components shall not be dismantled for shipment unless written permission is received from the Commissioner.

PART II - PRODUCTS

2.1 MATERIALS

A. Concrete: Concrete shall conform to the requirements of Specification 03300.

B. Reinforcing: Provide reinforcements as required for handling of units and as recommended by precast manufacturer.

C. Grout: Conform placement grout to ASTM C475: Standard Specification for Grout for Masonry.

D. Aggregate: Fine and coarse aggregates for exposed finish shall be obtained from a single source for the entire project. Aggregate shall be clean, hard, strong, durable and inert, shall be free of staining or deleterious material and shall conform to ASTM C33 or C330.

E. Facing: Thickness of facing shall be a minimum of 1-inch to 1-1/2-inch, or shall be the maximum size of aggregate used, whichever is larger. Water-cement and cement-aggregate ratio of facing mix and backup mix shall be the same.

F. Accessories: Anchors, cramps, dowels and similar ties for anchoring precast concrete shall be of Type 316 stainless steel, of the sizes and types shown.

2.2 FABRICATION

A. General: Architectural precast concrete shall be manufactured in accordance with PCI MNL-117.

B. Reinforcing Cover: Cover for reinforcing steel shall be a minimum of 3/4-inch. Metal chairs, with or without coating, shall not be used on the finished face.

C. Molds: Rigid molds shall be used to maintain units within specified tolerances conforming to the shape, lines and dimensions shown on the approved Working Drawings. Molds shall be constructed to withstand vibration method selected.

D. Concrete Conveying: Concrete shall be conveyed from the mixer to place of final deposit by methods which will prevent separation, segregation or loss of material. All concrete shall be consolidated in the mold by high frequency vibration, either internal or external, or a combination of both, to eliminate unintentional cold joints, honeycombing and to minimize entrapped air on vertical surfaces.

E. Curing: Precast concrete units shall be cured utilizing procedures in Specification 033000 until such time as the compressive strength is high enough to ensure that stripping does not have any effect on the performance or appearance of the final product.

F. Identification: Each precast architectural concrete panel shall be marked corresponding to identification mark on Working Drawings for panel location. Each precast concrete panel shall be marked with the date of casting.

G. Rejection: Architectural precast concrete units which do not meet the color and texture range or the dimensional tolerances shall be rejected if they cannot be corrected to the satisfaction of the Commissioner.

H. Finishing: Finish precast concrete coping and cladding to match existing Nature Walk precast concrete coping and cladding.

PART III - EXECUTION

3.1 EXAMINATION

A. The Contractor shall verify that areas to receive precast architectural concrete panels are properly prepared and completed to final elevations as shown on the Contract Drawings.

3.2 INSTALLATION

A. General: Precast architectural concrete shall be installed in accordance with the manufacturer's recommendations and approved Working Drawings.

B. Tolerances: Precast concrete units shall be set level, plumb, square and true within allowable tolerances in accordance with PCI-MNL-120.

C. Temporary Supports: Temporary supports and bracing shall be provided as required to maintain position, stability and alignment as units are being permanently connected.

D. Setting Units: Non-loadbearing units shall be set dry without mortar. Specified joint dimensions shall be attained with 300 series stainless steel or plastic spacing shims.

E. Fastening Requirements: Precast concrete units shall be fastened in place by bolting or welding or both, grouting sleeves and pockets, and placing cast-in- place concrete joints as indicated on the approved Working Drawings. Precast concrete panels shall be fastened in place in accordance with design intentions shown on the Contract Drawings.

F. Removal of Temporary Devices: Temporary lifting and handling devices cast into the precast concrete units shall be completely removed. If protectively treated, however, devices not visible in the finished Work may be left in place only where they do not interfere with the work of any other trade.

G. All anchors, cramps, dowels and similar ties shall be furnished and set for proper erection.

H. Fully seal joints and space units evenly 1/2 inch apart. Provide joint sealant type compatible with adjacent materials and adequate for the intended use as recommended by the joint sealant manufacturer. Match color of adjacent surfaces.

3.3 REPAIR

A. Repair of Exterior Surfaces: Concrete repairs shall meet the requirements of Specification Section 03 30 00. Where required, and subject to the approval of the Commissioner, damaged exposed exterior surfaces shall be repaired to match color and

texture of surrounding concrete and to minimize shrinkage.

3.4 PROTECTION

A. Protect precast architectural concrete units from all damage and abuse from all other Contractors and installers involved in the Work until Final Acceptance by the City.

3.5 CLEANING

A. Cleaning: After installation and joint treatment, precast concrete surfaces shall be cleaned with detergent and water, using soft fiber brushes and sponges. Units shall be rinsed thoroughly with clean water in accordance with the precast concrete manufacturer's recommendation. Cleaning materials and processes shall be used which will not change the character or color of exposed concrete finishes.

END OF SECTION 03 45 00

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SECTION 05 08 10
Galvanizing

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.

1.2 SECTION INCLUDES

A. Where galvanizing is called for on the Contract Drawings this Section covers all iron or steel materials which are to be galvanized.

B. All galvanizing shall be done by the hot-dip process.

1.3 REFERENCES

A. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

B. ASTM A90 - Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

C. ASTM A116 - Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric

D. ASTM A121 - Zinc-Coated (Galvanized) Steel Barbed Wire

E. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

F. ASTM A143 - Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement

G. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware

H. ASTM A239 - Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip)

I. ASTM A384 - Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies

J. ASTM A385 - Practice for Providing High-Quality Zinc Coatings (Hot-Dip)

K. ASTM A392 - Zinc-Coated Steel Chain-Link Fence Fabric

L. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

M. ASTM A780 - Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

N. ASTM A924 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

O. ASTM B6 - Specification for Zinc

P. ASTM E536 - Test Methods for Chemical Analysis of Zinc and Zinc Alloys

Q. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated

R. CSA G164-M - Hot Dip Galvanizing of Irregularly Shaped Articles

S. American Galvanizers Association (AGA)

T. Canadian Standards Association (CSA)

1.4 TESTS

A. General: Samples of galvanized articles shall be taken as specified in the appropriate ASTMs listed in Table 1. Galvanized articles shall be tested to determine the following qualities of the coating:

1. Thickness of coating
2. Adherence
3. Uniformity.

B. Thickness of the zinc coating may be tested either by the weighing or stripping methods in conformity with the requirements set forth in Table 1.

C. Adherence of zinc coating shall be tested by the method indicated in the appropriate ASTMs listed in Table 1.

D. Uniformity:

1. Galvanized articles will be subjected to visual examination to determine uniformity of work.
2. In the event the Commissioner determines that such examination is not conclusive, the article shall be given the Preece test in conformity with ASTM A239.

1.5 SUBMITTALS

A. The Contractor shall submit Shop Drawings for approval by the Commissioner. The submittals shall include, but not be limited to:

1. The producer's or supplier's certification that the galvanized articles were manufactured, sampled, tested and inspected in accordance with the applicable standards specified herein and that the articles meet these requirements

B. A report of the test results shall be furnished to the Commissioner.

1.6 QUALIFICATIONS

A. Galvanizing shall be done in a plant having sufficient facilities to produce the quality of coatings herein specified and ample capacity for the volume of work required.

B. The plant shall follow the procedures in the Quality Assurance Manual of the AGA.

1.7 SHIPPING AND HANDLING

A. Galvanized articles shall be shipped and handled in a manner which will avoid damage to the zinc coating.

PART II PRODUCTS

2.1 MATERIALS

A. Zinc used for galvanizing shall conform to ASTM B6, and shall be at least equal to the grade designated as Prime Western.

B. Maximum amount of aluminum added to a galvanizing bath shall not exceed 0.01 percent.

PART III EXECUTION

3.1 PREPARATION OF MATERIALS

A. Structural steel products shall be safeguarded against embrittlement in accordance with ASTM A143.

B. Casting surfaces to be galvanized shall be sand blasted or ground smooth. When a smooth cast is required, castings shall be tumbled and all high spots ground flush. Castings shall be normalized to prevent cracking. Malleable iron shall be safeguarded against embrittlement by pre-annealling.

C. Steel work shall be pre-cleaned utilizing a caustic bath, acid pickle and flux or shall be blast cleaned and fluxed to obtain an acceptable surface for quality hot dip galvanizing.

3.2 METHOD OF GALVANIZING

A. All galvanizing shall be done by the hot-dip process in conformity with the appropriate ASTM Specifications listed in Table 1.

B. Methods tending to agitate the dross shall not be used, and materials shall not contact the dross at any time.

C. Chemical analysis for impurities in the bath shall be made in conformity with ASTM E536.

3.3 SCHEDULE OF REQUIREMENTS

A. Table 1 - Schedule of Hot-Dip Galvanizing Requirements:

1. The work shall conform to the requirements of the tabulated standards in Table 1 on the following pages.

B. Notes Applicable to Table 1:

1. Prefixes A, B and E identify ASTM Specifications; prefix G identifies CSA Standard.

2. Galvanized articles shall not be subject to wiping or scraping processes which may reduce the thickness of zinc coating.

3. Small hardware items shall be centrifuged to remove excess bath metal.

C. Quality of Coating:

1. The zinc coating shall meet the standards set forth in Table 1, ASTM A385 and CSA G164-M. The coating shall adhere firmly to the surface of the base metal, be continuous, uniform in thickness, and of the quality of finish specified.

2. All rejected materials shall be stripped and regalvanized before resubmitting for inspection and test.

3.4 REPAIR OF GALVANIZED COATINGS

A. Galvanized coatings that are abraded or damaged shall be repaired in accordance with ASTM A780.

B. The extent of the area to be repaired and the method of repair to be used shall be approved by the Commissioner.

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TABLE 1 - SCHEDULE OF HOT-DIP GALVANIZING REQUIREMENTS

CLASS OF WORK	ZINC		TEST OF ZINC COATING				COATING THICKNESS
			Thickness				Oz. Per Sq. Ft.
	Slab & Chemical Analysis	Coating	By Weight	By Stripping	Adherence	Uniformity	Minimum
IRON & STEEL STRUCTURAL $ Rolled, pressed and forged, shapes, castings, plates, bars and strips $ Gratings, iron and steel	B6, E536	A123	A123	A90, G164-M	A123	A123, A239	Table 1, A123
SHEETS $ Iron and steel	B6, E536	A653	A653, A924	A90, A924	A653	A239	Table 1, A653
HARDWARE $ Castings of malleable iron and steel $ Rolled, pressed, forged articles $ Threaded fasteners $ Very small work: rivets, nails, tacks, pins, small bolts and screws, stove bolts $ Turnbuckles and similar work $ Chain	B6, E536	A153	A153	A90, G164-M	A153	A153, A239	Table 1, A153

END OF SECTION 05 08 10

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SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Structural steel.
2. Field-installed shear connectors.
3. Grout.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications including stainless structural steel and other steel items not defined as structural steel.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data: For each type of product.

C. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pre-tensioned and slip-critical, high-strength bolted connections.

D. Engineering Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Qualification Data: For Installer, fabricator, shop-painting, applicators, professional engineer, and testing agency.

C. Welding certificates.

D. Mill test reports for structural steel, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shear stud connectors.
5. Shop primers.
6. Nonshrink grout.

F. Source quality-control reports.

G. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications:

1. The manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years.

B. Installer Qualifications:

1. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

1. All welding shall be performed by certified welders under the immediate supervision of a representative of a standard testing agency or an inspection agency reporting to and under the control of the City.

D. Comply with applicable provisions of the following specifications and documents:

2. AISC 303.
3. AISC 341 and AISC 341s1.
4. AISC 360.
5. RCSC's "Specification for Structural Joints Using High Strength Bolts."

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Commissioner's testing and inspecting agency observes repackaging and seals containers.

2. Clean and relubricate bolts and nuts that become dry or rusty before use.

3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART II - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

2.2 STRUCTURAL-STEEL MATERIALS (Unless noted otherwise on drawings)

A. W-Shapes: ASTM A 992/A 992M.

B. Channels, Angles -Shapes: ASTM A 572/A 572M, Grade 36.

C. Plate and Bar: ASTM A 572/A 572M, Grade 36.

D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.

E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.

1. Weight Class: As indicated
2. Finish: Black except where indicated to be galvanized.

F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

B. Stainless Steel Bolts, Nuts, and Washers: See Section 055000 "Metal Fabrications".

C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

D. Unheaded Anchor Rods: ASTM F 1554, Grade 36 .

1. Configuration: Straight.
2. Nuts: ASTM A 563 heavy-hex carbon steel.
3. Plate Washers: ASTM A 36/A 36M carbon steel.
4. Washers: ASTM F 436, Type 1, hardened carbon steel.

5. Finish: Plain.

E. Headed Anchor Rods: ASTM F 1554, Grade 36 ASTM F 1554, Grade 55, weldable, straight.

1. Nuts: ASTM A 563 heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436, Type 1, hardened carbon steel.
4. Finish: Plain.

F. Threaded Rods: ASTM A 36/A 36M .

1. Nuts: ASTM A 563 heavy-hex carbon steel.
2. Washers: ASTM F 436, Type 1, hardened carbon steel.
3. Finish: Plain.

G. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

H. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

I. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Connections: Unless noted otherwise on the Contract drawings. All beam connections shall be designed for reaction values indicated on the Contract Drawings. Wherever beam reaction values or connection details are not shown, the connection shall be designed to support half the Maximum Total Uniform Load capacity tabulated in the AISC tables for laterally supported beams for the given shape, span, and steel specified for the beam in question

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. Except where otherwise noted on the Contract Drawings or in this Specification, or pre-approved by the Commissioner, all shop connections shall be welded.

B. High-Strength Bolts (where applicable): Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

2. Bolted connections shall use high strength bolts in bearing –type connections according to the RCSC Specification for Structural Joints using High Strength Bolts.

C. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2.8 SOURCE QUALITY CONTROL

A. Shop inspections may be made by the Commissioner. The Contractor shall give ample notice to the Commissioner prior to the beginning of any fabrication work so that inspection may be provided. The Contractor shall furnish all facilities for the inspection of materials and workmanship in the shop, and the inspectors shall be allowed free access to the necessary parts of the works. The Commissioner shall have the authority to reject any materials or work which does not meet the requirements of these specifications. Inspection at the shop is intended as a means of facilitating the work and avoiding errors, but is expressly understood that it will in no way relieve the Contractor from his responsibility for furnishing proper materials or workmanship under this Specification.

B. Testing Agency: Contractor shall engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

C. Bolted Connections: Inspect and test shop-bolted connections according to RCSC's "Specification for Structural Joints Using High Strength Bolts."

D. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

F. Prepare test and inspection reports.

PART III - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Pretension anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

2. Bolted connections shall use high strength bolts in bearing –type connections according to the RCSC's "Specification for Structural Joints using High Strength Bolts."

3. The furnishing and installation of high-strength bolts, washers and nuts shall be in conformity with relevant sections of the New York City Building Code, the rules of the New York City Building Department and resolutions of the New York City Board of Standards & Appeals.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: City of NY will engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using High Strength Bolts."

C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 05 12 00

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

B. Related Work specified in other sections includes, but is not limited to, the following:

1. Division 05 12 00 - Structural Steel Framing.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. The Aluminum Association, Inc. (AA): The Aluminum Design Manual.

2. American Galvanizers Association (AGA): Inspection of Products Hot-Dip Galvanized After Fabrication.

3. American Institute of Steel Construction (AISC): S329, Allowable Stress Design Specification for Structural Joints using ASTM A325 or A490 Bolts.

4. American Iron and Steel Institute (AISI): Stainless Steel Types.

5. American National Standards Institute (ANSI).

6. American Society of Mechanical Engineers (ASME): B1.1, Unified-inch Screw Threads (UN and UNR Thread Form).

7. American Society of Safety Engineers (ASSE): A10.11, Safety Requirements for Personnel and Debris Nets.

8. American Welding Society (AWS):

   a. D1.1, Structural Welding Code - Steel.
   b. D1.2, Structural Welding Code - Aluminum.
   c. D1.6, Structural Welding Code - Stainless Steel.

9. ASTM International (ASTM):

   a. A36, Specification for Carbon Structural Steel.

   b. A48, Specification for Gray Iron Castings.

   c. A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

   d. A108, Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.

   e. A123, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

   f. A143, Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

   g. A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

   h. A193, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.

   i. A194, Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.

   j. A240, Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.

   k. A276, Specification for Stainless Steel Bars and Shapes.

   l. A278, Specification for Gray Iron Castings for Pressure- Containing Parts for Temperatures Up to 650 Degree.

   m. A283, Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

   n. A307, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.

   o. A325, Specification for Structural Bolts, Steel, Heat Treated 120/105 ksi Minimum Tensile Strength.

   p. A380, Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.

q. A384, Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.

r. A385, Practice for Providing High-Quality Zinc Coatings (Hot-Dip).

s. A489, Specification for Carbon Steel Lifting Eyes.

t. A500, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

u. A501, Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

v. A563, Specification for Carbon and Alloy Steel Nuts.

w. A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

x. A780, Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

y. A786, Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.

z. A793, Specification for Rolled Floor Plate, Stainless Steel.

aa. A967, Specification for Chemical Passivation Treatments for Stainless Steel Parts.

bb. A992, Specification for Steel for Structural Shapes for Use in Building Framing

cc. B209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

dd. B308, Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.

ee. B429, Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

ff. B632, Specification for Aluminum-Alloy Rolled Tread Plate.

gg. D1056, Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

hh. F436, Specification for Hardened Steel Washers.

ii. F468, Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.

jj. F593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

kk. F594, Specification for Stainless Steel Nuts.

ll. F844, Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.

mm. F1554, Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

10. International Code Council (ICC): Evaluation Reports for Concrete and Masonry Anchors.

11. Specialty Steel Industry of North America (SSINA):

a. Specifications for Stainless Steel.

b. Design Guidelines for the Selection and Use of Stainless Steel.

c. Stainless Steel Fabrication.

d. Stainless Steel Fasteners.

1.3 SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Action Submittals:

1. Shop Drawings:

a. Metal fabrications, including welding and fastener information.

b. Specific instructions for concrete anchor installation, including drilled hole size, preparation, placement, procedures, and instructions for safe handling of anchoring systems.

c. Prepare shop drawings under the supervision of a Structural Engineer licensed in the State of New York.

2. Submit signed and sealed calculations for Structural components by a Structural Engineer licensed in the State of New York.

C. Informational Submittals:

1. Concrete and Masonry Drilled Anchors:

a. Manufacturer's product description and installation procedures.

b. Current test data or ICC Evaluation Report.

c. Adhesive Anchor Installer Certification.

2. U-Channel Concrete Inserts:

a. Manufacturer's product description.

b. Allowable load tables.

3. Passivation method for stainless steel members.

4. Hot-Dip Galvanizing: Certificate of compliance signed by galvanizer, with description of material processed and ASTM standard used for coating.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Adhesive Anchor Installers: Trained by manufacturer.

2. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of Quality Assurance Manual of the American Galvanizers Association.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Insofar as practical, factory assemble items specified herein. Assemblies that due to necessity have to be shipped unassembled will be packaged and tagged in manner that will protect materials from damage and will facilitate identification and field assembly.

B. Package stainless steel items in a manner to provide protection from carbon impregnation.

C. Protect painted coatings and hot-dip galvanized finishes from damage due to metal banding and rough handling. Use padded slings and straps.

D. Store fabricated items in dry area, not in direct contact with ground.

PART 2 - PRODUCTS

2.1 GENERAL

A. For hot-dip galvanized steel that is exposed to view and does not receive paint, limit the combined phosphorus and silicon content to 0.04 percent. For steels that require a minimum of 0.15 percent silicon (such as plates over 1.5 inches thick for A36 steel), limit the maximum silicon content to 0.21 percent and the phosphorous content to 0.03 percent.

B. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Steel Shapes and Plates	A36
Steel Pipe	A501 or A53, Type E or S, Grade B
Structural Steel Tubing	A500, Grade B
Stainless Steel:	
Bars and Angles	A276, AISI Type 316 (316L for welded connections)
Shapes	A276, AISI Type 304 (304L for welded connections)
Steel Plate, Sheet, and Strip	A240, AISI Type 316 (316L for welded connections)
Bolts, Threaded Rods, Anchor Bolts, and Anchor Studs	F593, AISI Type 316, Condition CW
Nuts	F594, AISI Type 316, Condition CW
Steel Bolts and Nuts:	
Carbon Steel	A307 bolts, with A563 nuts
High-Strength	A325, Type 1 bolts, with A563 nuts
Anchor Bolts and Rods	F1554, Grade 36, 55, 105 with weldability supplement S1.
Eyebolts	A489
Threaded Rods	A36
Flat Washers (Unhardened)	F844
Flat and Beveled Washers (Hardened)	F436
Thrust Ties for Steel Pipe:	
Threaded Rods	A193, Grade B7

Item	ASTM Reference
Nuts	A194, Grade 2H
Plate	A283, Grade D
Welded Anchor Studs	A108, Grades C-1010 through C-1020
Aluminum Plates and Structural Shapes	B209 and B308, Alloy 6061-T6
Aluminum Bolts and Nuts	F468, Alloy 2024-T4
Cast Iron	A48, Class 35

C. Bolts, Washers, and Nuts: Use stainless steel, hot-dip galvanized steel, zinc-plated steel, and aluminum material types as indicated in Fastener Schedule at end of this section.

2.2 ANCHOR BOLTS AND ANCHOR BOLT SLEEVES

A. Cast-In-Place Anchor Bolts:

1. Headed type, unless otherwise shown on Drawings.

2. Material type and protective coating as shown in Fastener Schedule at end of this section.

B. Anchor Bolt Sleeves:

1. Plastic:

a. Single unit construction with corrugated sleeve.

b. Top of sleeve will be self-threading to provide adjustment of threaded anchor bolt projection.

c. Material: High density polyethylene.

d. Manufacturer: Sinco Products, Inc., Middletown, CT, (800) 243-6753 or approved equal.

2. Fabricated Steel: ASTM A36.

2.3 CONCRETE AND MASONRY DRILLED ANCHORS

A. General:

1. AISI Type 316 stainless, hot-dip galvanized, or zinc-plated steel.

2. Current evaluation and acceptance reports by ICC or other similar code organization.

B. Wedge Anchors:

1. Manufacturers and Products:

a. ITW Ramset/Red Head, Addison, IL; Trubolt Wedge Anchor.

b. Hilti, Inc., Tulsa, OK; Kwik-Bolt-3 (KB-3) Anchor.

c. Powers Fasteners, New Rochelle, NY; Power-Stud Anchor.

d. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Wedge-All Anchor.

e. Wej-It Corp., Tulsa, OK; ANKRtite Wedge Anchor.

f. Adhesives Technology, Pompano Beach, FL; Kingpin Wedge Anchor.

g. Unitex, Kansas City, MO; Pro-Poxy 300 and Pro-Poxy 300 Fast Epoxy Adhesive Anchors.

h. Or approved equal.

C. Expansion Anchors:

1. Self-drilling anchors, snap-off or flush type, zinc-plated.

2. Nondrilling Anchors: Flush type for use with zinc-plated or stainless steel bolt, or stud type with projecting threaded stud.

3. Manufacturers and Products:

a. ITW Ramset/Red Head, Addison, IL; Multi-Set II Drop-In and Self Drill Anchor.

b. Hilti, Inc., Tulsa, OK; Hilti HDI Drop-In Anchor.

c. Powers Fasteners, New Rochelle, NY; Steel Drop-In Anchor.

d. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Drop-In Anchor.

e. Or approved equal.

D. Undercut Anchors:

1. Manufacturers and Products:

a. USP Structural Connectors; DUC Undercut Anchor.

b. Hilti, Inc., Tulsa OK; HDA Undercut Anchor.

c. Or approved equal.

E. Sleeve Anchors:

1. Manufacturers and Products:

a. ITW Ramset/Red Head, Addison, IL; Dynabolt Hex Nut Sleeve Anchor.

b. Powers Fasteners, New Rochelle, NY; Hex Head Power-Bolt Anchor.

c. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Sleeve-All Hex Head Anchor.

d. Wej-It Corp., Tulsa, OK; Wej-It Sleeve Anchor.

e. Hilti, Inc., Tulsa, OK; HSL-3 Heavy Duty Sleeve Anchor.

f. Or approved equal.

F. Screw Anchors:

1. Manufacturers and Products:

a. Hilti, Inc., Tulsa, OK; KWIK HUS.

b. Powers Fasteners, Brewster, NY; Wedge-Bolt+

c. Simpson Strong-Tie Co., Inc., Pleasanton, CA; TITEN HD

d. Or approved equal.

G. Adhesive Anchors:

1. Threaded Rod:

a. ASTM F593 stainless steel threaded rod, diameter as shown on Drawings.

b. Length as required, to provide minimum depth of embedment.

c. Clean and free of grease, oil, or other deleterious material.

d. For hollow-unit masonry, provide galvanized or stainless steel wire cloth screen tube to fit threaded rod.

2. Adhesive:

   a. Two-component, designed to be used in adverse freeze/thaw environments, with gray color after mixing.

   b. Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.

   c. Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.

3. Packaging and Storage:

   a. Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.

   b. Store adhesive cartridges on pallets or shelving in covered storage area, in accordance with manufacturer's written instructions.

   c. Cartridge Markings: Include manufacturer's name, product name, material type, batch or serial number, and adhesive expiration date.

   d. Dispose of cartridges if shelf life has expired.

4. Manufacturers and Products:

   a. Adhesives Technology, Pompano Beach, FL; Ultrabond 1 Epoxy Anchor System.

   b. Hilti, Inc., Tulsa, OK; HIT HY 150 Adhesive Anchor System, (use HIT HY 20 for hollow masonry).

   c. ITW Ramset/Red Head, Addison, IL; C6 Adhesive Anchor System or A7 Adhesive Anchor System. (Use A7 Adhesive Anchor System for hollow masonry.)

   d. Simpson Strong-Tie Co., Inc., Pleasanton, CA; ET Epoxy-Tie Adhesive or Acrylic-Tie Adhesive. (Use Acrylic-Tie Adhesive for temperatures below 40 degrees F.)

   e. Unitex, Kansas City, MO; Pro-Poxy 300 Adhesive Anchors or Pro-Poxy 300 Fast Epoxy Adhesive Anchors.

   f. USP Structural Connectors CIA-Gel 7000 Epoxy Anchoring System.

   g. Or approved equal.

H. Adhesive Threaded Inserts:

1. Stainless steel, internally threaded insert.

2. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-R Insert with HIT HY 150 adhesive.

a. Or approved equal.

2.4 WELDED ANCHOR STUDS

A. Headed anchor studs (HAS) or threaded anchor studs (TAS), as indicated on Drawings.

1. Carbon Steel: ASTM A108, Standard Quality Grades 1010 through 1020, inclusive either semi-kilned or kilned aluminum or silicon dioxidation, unless indicated otherwise.

2. Stainless Steel: ASTM F593, AISI Type 316, Condition CW, where indicated.

B. Manufacturers:

1. Nelson Stud Welding, FabriSteel Co., Elyria, OH.

2. Stud Welding Associates, Inc., Elyria, OH.

3. Or approved equal.

2.5 EMBEDDED STEEL SUPPORT FRAMES FOR FLOOR PLATE AND GRATING

A. Steel angle support frames to be embedded in concrete will be stainless steel, ASTM A276, AISI Type 316, unless indicated otherwise.

B. Welded anchors for stainless steel support frames will also be stainless steel.

2.6 U-CHANNEL CONCRETE INSERTS

A. Rolled ASTM A240, AISI Type 316 stainless steel, 0.105-inch thickness, 1-5/8-inch width by 1-3/8-inch depth, with stainless steel anchors at 10-inch maximum spacing, styrofoam fillers, and end caps.

B. Nut and Bolt Hardware: Type 316 stainless steel, 5/8-inch minimum diameter, unless indicated otherwise. Manufacturer's standard to match insert.

C. Manufacturers and Products:

1. Power-Strut, Wayne, MI; PS 349 Series.

2. B-Line Systems, Inc., Highland, IL; B32 Series.

3. Halfen Anchoring Systems, Converse, TX; Channel Type 4141HTA.

4. Or approved equal.

2.7 FABRICATION

A. General:

1. Finish exposed surfaces smooth, sharp, and to well-defined lines.

2. Furnish necessary rabbets, lugs, and brackets so work can be assembled in neat, substantial manner.

3. Conceal fastenings where practical; where exposed, flush countersink.

4. Drill metalwork and countersink holes as required for attaching hardware or other materials.

5. Grind cut edges smooth and straight. Round sharp edges to small uniform radius. Grind burrs, jagged edges, and surface defects smooth.

6. Fit and assemble in largest practical sections for delivery to Site.

B. Materials:

1. Use stainless steel shapes, unless otherwise noted.

C. Welding:

1. Weld connections and grind exposed welds smooth. When required to be watertight, make welds continuous.

2. Welded fabrications will be free from twisting or distortion caused by improper welding techniques.

3. Stainless Steel: Meet requirements of AWS D1.6.

4. Welded Anchor Studs: Prepare surface to be welded and weld with stud welding gun in accordance with AWS D1.1, Section 7, and manufacturer's instructions.

5. Complete welding before applying finish.

D. Galvanic corrosion protection

1. Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals.

2. Do not apply protective coating to galvanized steel anchor bolts or galvanized steel welded anchor studs, unless indicated otherwise.

E. Galvanizing:

1. Fabricate steel to be galvanized in accordance with ASTM A143, ASTM A384, and ASTM A385. Avoid fabrication techniques that could cause distortion or embrittlement of the steel.

2. Provide venting and drain holes for tubular members and fabricated assemblies in accordance with ASTM A385.

3. Remove welding slag, splatter, burrs, grease, oil, paint, lacquer, and other deleterious material prior to delivery for galvanizing.

4. Remove by blast cleaning or other methods surface contaminants and coatings not removable by normal chemical cleaning process in the galvanizing operation.

5. Hot-dip galvanize steel members, fabrications, and assemblies after fabrication in accordance with ASTM A123/.

6. Hot-dip galvanize bolts, nuts, washers, and hardware components in accordance with ASTM A153. Oversize holes to allow for zinc alloy growth. Shop assemble bolts and nuts.

7. Galvanized steel sheets in accordance with ASTM A653.

8. Galvanize components of bolted assemblies separately before assembly. Galvanizing of tapped holes is not required.

F. Fitting: Where movement of fabrications is required or shown, cut, fit, and align items for smooth operation. Make corners square and opposite sides parallel.

G. Accessories: Furnish as required for a complete installation. Fasten by welding or with stainless steel bolts or screws.

2.8 SOURCE QUALITY CONTROL

A. Visually inspect all fabrication welds and correct any deficiencies.

1. Steel: AWS D1.1, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.

2. Aluminum: AWS D1.2.

3. Stainless Steel: AWS D1.6.

B. Hot-Dip Galvanizing:

1. Retain an independent testing agency for approval by Commissioner to inspect and test hot-dip galvanized fabricated items in accordance with ASTM A123 and ASTM A153 Visually inspect and test for thickness and adhesion of zinc coating for minimum of three test samples from each lot in accordance with ASTM A123 and ASTM A153

2. Reject and retest nonconforming articles in accordance with ASTM A123 and ASTM A153.

PART 3 - EXECUTION

3.1 INSTALLATION OF METAL FABRICATIONS

A. General:

1. Install metal fabrications plumb or level, accurately fitted, free from distortion or defects.

2. Install rigid, substantial, and neat in appearance.

3. Install manufactured products in accordance with manufacturer's recommendations.

4. Obtain Commissioner approval prior to field cutting steel members or making adjustments not scheduled.

3.2 CAST-IN-PLACE ANCHOR BOLTS

A. Accurately locate and hold anchor bolts in place with templates at the time concrete is placed.

B. Use anchor bolt sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.

C. Minimum Bolt Size: 1/2-inch diameter by 12 inches long, unless otherwise shown.

3.3 CONCRETE DRILLED ANCHORS

A. Begin installation only after concrete to receive anchors has attained design strength.

B. Install in accordance with manufacturer's instructions.

C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer's instructions or shown otherwise on Drawings:

Anchor Type	Min. Embedment (bolt diameters)	Min. Edge Distance (bolt diameters)	Min. Spacing (bolt diameters)
Wedge	9	6	12
Expansion and Sleeve	4	6	12
Undercut	9	12	16
Adhesive	9	9	13.5

D. Use only drill type and bit type and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.

E. For undercut anchors, use special undercutting drill bit and rotary hammer drill and apply final torque as recommended by anchor manufacturer.

F. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify Commissioner for direction on how to proceed.

G. Adhesive Anchors:

1. Do not install adhesive anchors when temperature of concrete is below 40 degrees F (25 degrees F for Simpson Strong-Tie Acrylic-Tie Adhesive) or above 100 degrees F.

2. Remove any standing water from hole with oil-free compressed air. Make inside surface of hole dry where required by manufacturer's instructions.

3. Do not disturb anchor during recommended curing time.

4. Do not exceed maximum torque as specified in manufacturer's instructions.

3.4 ELECTROLYTIC PROTECTION

A. Stainless Steel:

1. During handling and installation, take necessary precautions to prevent carbon impregnation of stainless steel members.

2. After installation, visually inspect stainless steel surfaces for evidence of iron rust, oil, paint, and other forms of contamination.

3. Remove contamination in accordance with requirements of ASTM A380 and ASTM A967.

4. Brushes used to remove foreign substances will utilize only stainless steel or nonmetallic bristles.

5. After treatment, visually inspect surfaces for compliance.

3.5 PAINTING AND REPAIR OF GALVANIZED STEEL

A. Painted Galvanized Surfaces:

1. Conform to ASTM A780.

2. For minor repairs at abraded areas, use sprayed zinc conforming to ASTM A780.

3. For flame cut or welded areas, use zinc-based solder, or zinc sticks, conforming to ASTM A780.

4. Use magnetic gauge to determine that thickness is equal to or greater than the base galvanized coating.

3.6 FIELD QUALITY CONTROL

A. Welded Anchor Studs:

1. At start of each production period perform the following test to determine proper generator, control unit, and stud welding gun settings, in accordance with AWS D1.1, Chapter 7:

a. Weld two test studs and visually inspect for full 360-degree flash.

b. Bend test studs 30 degrees from vertical for headed anchor studs (HAS). Torque test threaded anchor studs (TAS) studs per AWS D1.1, Section 7.6.6.2.

c. Test studs will be acceptable if there is no failure of welds.

d. If weld fails, repeat test until two consecutive test studs test to be satisfactory.

2. During production, if visual inspection reveals that weld does not exhibit full 360-degree flash or that stud has been repaired by welding, perform the following test in accordance with AWS D1.1, Chapter 7:

a. HAS studs, bend stud approximately 15 degrees from vertical, away from missing portion of flash. For TAS studs, torque test per AWS D1.1, Section 7.6.6.2.

b. Studs meeting this test without exhibiting cracks in weld will be considered acceptable and left in bent position.

c. Replace studs failing test.

B. Concrete Drilled Anchors: Special inspection and testing will be provided by Engineer where indicated on Drawings.

3.7 MANUFACTURER'S SERVICES

A. Adhesive Anchors: Conduct site instuction of installation personnel for proper installation, handling, and storage of adhesive anchor system. Notify Commissioner of time and place for sessions.

END OF SECTION 05 50 00

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SECTION 05 56 00
METAL CASTINGS

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.

1.2 SECTION INCLUDES

A. Miscellaneous ferrous and nonferrous castings.

1. This classification includes wheel guards, valve boxes, manhole frames and covers, manhole steps, catch basin inlets and covers, curb inlets, stop plank grooves, brackets and supports for piping, gutter inlets, roof and floor drains, cleanouts, trench drain frames and grates, water meter box covers, slide plate grooves, electrical castings, and special malleable iron castings and inserts.

1.3 REFERENCES

A. Codes and standards referred to in this Section are:

B. AASHTO M306- Standard Specification for Drainage Structure Castings

C. ASTM A 27/A27M - Specification for Steel Castings, Carbon for General Applications

D. ASTM A 47 - Specification for Ferric Malleable Iron Castings

E. ASTM A 48 - Specifications for Gray Cast Iron Castings

F. ASTM A 148/A148M -Specifications for Steel Castings

G. ASTM A 536 - Specifications for Ductile Iron Castings

H. ASTM B 26/B26M - Aluminum Alloy Sand Castings

I. ASTM B 148- Aluminum Bronze Sand Castings

J. ASTM B 584- Manganese Bronze K.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted as an "or approved equal".

1. East Jordan Iron Works
2. Neenah Foundry Company
3. U.S. Foundry

2.2 MATERIALS

A. Conform gray iron castings to ASTM A 48 Grade 35B.

B. Conform ductile iron castings to ASTM A 536 Grade 65-45-12.

C. Conform aluminum alloy castings to ASTM B 26 Alloy 356.0 T6.

2.3 FABRICATION

A. Provide castings of uniform quality and free of sand holes, gas holes, shrinkage cracks and other surface defects. Accurately make drainage structure castings to meet the tolerances in AASHTO M306 Section 4.2. Plane or grind castings to secure flat and true surfaces. Make allowance in the patterns so that the specified thickness is not reduced. Provide manhole covers which conform to the details shown and which are true and seat at all points. Do not provide defective castings that have been plugged or welded. Supply castings showing the name of the manufacturer, the country of manufacture, ASTM material designation, individual part number, and cast or heat date. Mark pairs of machined castings to facilitate subsequent identification during installation. Do not paint castings.

B. Cast manhole covers with a checkered top design.

1. Provide water manhole covers with the word "WATER" cast in the center.

2. Provide sanitary and combined sewer manhole covers with the words "SANITARY SEWER" cast in the center.

3. Provide storm sewer manhole covers with the words "STORM SEWER" cast in the center.

4. Provide electrical manhole covers with the word "ELECTRICAL" cast in the center.

2.4 SOURCE QUALITY CONTROL

A. Load Test: Proof load test the first article of each traffic service casting in accordance with the method and procedure outlined in AASHTO M306, Section 7.0. Maintain test results at the foundry for 1 year. Furnish the results of the proof load tests upon request.

B. Weight: Reject castings with a weight which is less than the theoretical weight based on required dimensions by more than 5 percent. Provide facilities at the site for weighing castings, or furnish invoices showing true weights, certified by the supplier.

C. Certification: Furnish a foundry certification stating that samples representing each lot have been tested, inspected, and are in accordance with this specification.

PART III - EXECUTION

3.1 INSTALLATION

A. Erect all castings to accurate grades and alignment, and when placing in concrete carefully support castings to prevent movement during concreting.

3.2 PAINTING

A. Clean metal castings thoroughly before painting. Give manhole frames and covers and valve boxes one coat of primer and two coats of an approved asphaltum varnish or other approved coating at the point of manufacture. Deliver all other castings to the jobsite unpainted.

END OF SECTION 05 56 00

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SECTION 05 70 00
ORNAMENTAL STAINLESS STEEL FENCES AND RAILING

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. Related Work specified in other sections includes, but is not limited to, the following:

1. Section 05 50 00 – Metal Fabrications

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1. ASTM A 554 - Standard Specification for Welded Stainless Steel Mechanical Tubing
2. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
3. ASTM C 920 - Specification for Elastomeric Joint Sealants.
4. ASTM C 1193 - Guide for Use of Joint Sealants.
5. NAAMM - National Association Of Architectural Metal Manufacturers

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide railings capable to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Stainless Steel: 60 percent of minimum yield strength.

B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Top Rails of Guards and Handrails:

a. Uniform load of 50 lbf/ ft. applied in any direction.

b. Concentrated load of 200 lbf applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

C. Provide ornamental fences capable of withstanding the effects of gravity loads and the following loads:

1. 90 mph windload assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

D. Thermal Movements: Provide exterior railings and fences that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces

E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data, signed and sealed by a Professional Engineer licensed in New York State.

D. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

E. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing and fencing member, including handrails, top rails, posts, and balusters.

2. Fittings and brackets.

3. Welded connections.

4. Assembled Samples of railing and fencing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.

F. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

G. Welding certificates.

H. Qualification Data: For professional engineer.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according ASTM E 894 and ASTM E 935.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing and fencing through one source from a single manufacturer.

B. Fabricator Qualifications: The manufacturer providing the material or equipment specified in this section must, for the past five (5) years, have been regularly engaged in the manufacture of material or equipment similar in type to that required for this Project. Such similar material or equipment provided by the manufacturer must have been in satisfactory service for not less than five (5) years.

C. Installer Qualifications: The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in size, scope and type to the required work.

D. Do not modify intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If modifications are proposed, submit comprehensive explanatory data to Commissioner for review.

E. Welding: Qualify procedures and personnel according to the New York City Building Code.

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup for each type of railing and fencing to be provided (guardrail, handrail, etc.)

2. Build mockups that show weld quality, bends, and tube thickness of each tube diameter.

3. Each mockup must include at least one seamless butt joint, one tee joint, and one corner joint or bend.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings and fencing by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating railings and / or fencing without field measurements. Coordinate supports and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

2. Provide allowance for trimming and fitting at site.

1.7 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings and fences. 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.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings or fences temporarily by any means that do not satisfy structural performance requirements.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Tuttle Aluminum & Bronze.

2. Omega Industrial Products, Inc

3. Great Lakes Stair and Steel

4. Or approved equal

2.2 METALS, GENERAL

Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails, unless otherwise indicated.

2.3 STAINLESS STEEL

A. Circular sections:

1. Tubing: ASTM A 269, Grade MT 316

a. Wall thickness:

(i) Schedule 40 for tubes equal or bigger than 1.5 inch Outside Diameter.
(ii) For smaller diameters use stainless steel piping.

B. Rectangular sections:

1. Tubing: ASTM A554, Type 316

C. Piping: Schedule 40S, ASTM A 312, Type 316

D. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.

E. Plate and Sheet: ASTM A 666, Type 316

2.4 FASTENERS

A. General: Provide the following:

1. Stainless-Steel Components: Type 316 stainless-steel fasteners.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for attaching railings or fences to other work, unless otherwise indicated.

1. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Anchors: Provide cast-in-place chemical or torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.

C. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

D. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

E. 100% Silicone Sealant: Factory-packaged, nonsag, nonshrink, nonstaining, permanently waterproof, weatherproof, flexible, complying with ASTM C 920. At railing chord splice conditions provide sealant at the slotted hole and expansion joint locations after welding the pipe insert. Provide sealant recommended by manufacture for stainless steel conditions in a metallic gray color matching the fence.

2.6 SLIDING GATES

A. Manual gates: Provide manual sliding gates at locations indicated on the drawings and as follows:

1. Provide custom gates self-supported on rollers in material and design as shown on the drawings.

2. Provide stainless steel guiding rollers.

3. Provide manual gates capable of withstanding the effects of gravity loads and the following loads:
   a. 90 mph wind load assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

   b. Loads imposed by the operation of the door.

4. Gate locks: Provide stainless steel heavy duty gate locks operable with a key to fit on the tube frame diameter as follows:

   a. Manufacturer and Model:

      (1) Locinox type LSKZ

      (2) Signet HYB Gate lock

      (3) Came Lock L

      (4) Other approved equal by the Commissioner

   b. Provide chassis, self contained enclosure, mechanism, and twistfinger (catch bolt) or hook lock to be stainless steel.

   c. Provide lock with reversible twistfinger (catch bolt) or hook lock.

   d. Provide key lockable from both sides, with stainless steel chassis, mechanism, catch bolt, and bolts for left or right hand operation.

B. Motorized gates: Provide motorized gates at locations indicated on the drawings and as follows:

1. Comply with ASTM F1184-05(2010) Standard Specification for Industrial and Commercial Horizontal Slide Gates

2. Provide custom cantilevered gates in material and design as shown on the drawings.

3. Provide cast aluminum guiding rollers.

4. Provide motorized gates capable of withstanding the effects of gravity loads and the following loads:

   a. 90 mph windload assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

   b. Loads imposed by the operation of the door.

5. Operation: By means of a metal rail passing between a pair of hydraulically driven solid metal wheels with polyurethane treads.

6. Motor: Hydraulic, geroller type. With no belts, gears, pulleys, roller chains or sprockets to transfer power from operator to gate panel.

   a. Coordinate motor size with actual gate weight to comply with the operator pull force indicated.

7. Operator pull force: 300 pounds minimum horizontal pull force without the drive wheels slipping and without distortion of supporting arms and capable of moving the gates at the indicated speed.

8. Gate speed: min 1.0 ft per second capable of stopping gradually to prevent shock loads to the gate and operator assembly.

9. External sensors: Combination of photo eyes and gate edges to be installed such that the gate is capable of reversing in either direction upon sensing an obstruction.

10. Control device: Key-switch. At Commissioner's request make provisions to integrate Key to instructed keying system

11. Drive rail: Extruded aluminum type 6061 T6, not less than 1/8" thick. With incorporated alignment pins for ease of replacement or splicing and enabling a perfect butt splice.

12. Gate Operator: Provide a slide gate operator with the following characteristics:

    a. Provide Stainless steel chassis and tamper proof heavy gauge motor cover.
    b. Provide Heater with thermostat control for cold climate.
    c. Provide weather-stripped drive rail slot in chassis, and snow wiper blades for drive rail.
    d. Provide Lock for operator cover.
    e. Acceptable Manufacturers: HySecurity SlideDriver; LiftMaster; Door King; or approved equal.

13. Provide all minimum standard mechanical and electrical components listed in manufacturer's printed literature associated with the gate operator.

C. Gates: Provide gates at locations indicated on the drawings and as follows:

1. Provide gates capable of withstanding the effects of gravity loads and the following loads:

a. 90 mph windload assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

b. Loads imposed by the operation of the gate.

2. Hinges: Provide stainless steel raised barrel type hinges for hanging gate onto concrete opening.

3. Provide tamper proof screws for attaching hinges to gate and concrete.

4. Locks: Provide vandal proof mortise type lockset.

D. Provide Commissioner with two sets of keys for each lock and a master key to operate all locks installed under this job including mechanically operated gates.

2.7 FABRICATION

A. General: Fabricate railings and fences to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Provide rails made of stainless steel in the diameters indicated on drawings.

C. Assemble railings and fences in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces. All field connections shall be welded.

D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

E. Form work true to line and level with accurate angles and surfaces.

F. Fabricate exposed connections to be weather tight. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

H. Connections: Fabricate railings and fencing with welded connections, unless otherwise indicated.

I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Provide continuous weld at all connections and fittings.

1. Provide NAAMM AMP 521-01 Type 1 welded joints.

2. Use materials and methods that minimize distortion and maintain strength and corrosion resistance of base metals. Ensure that stainless steel does not contact non stainless steel materials during the fabrication process to prevent surface contamination.

3. Obtain fusion without undercut or overlap.

4. Remove flux immediately.

5. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

J. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

1. Bend Radius: as shown on drawings.

K. Close exposed ends of hollow railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

N. Provide inserts and other anchorage devices for connecting and fences to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings and fences. Coordinate anchorage devices with supporting structure.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment. Dispose and remove all protection prior to completion of project.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.

D. 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.

2.9 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Grind and polish surfaces to produce uniform finish indicated, free of cross scratches.

C. Directional Satin Finish: No. 4.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART III - EXECUTION

3.1 INSTALLATION

A. General: Install railing and fencing in accordance with the manufacturer's recommendations and approved shop drawings and as specified in DDC General Conditions.

B. Fit exposed connections together to form tight, hairline joints.

C. Perform cutting, drilling, and fitting required for installing railings and fencing. Set railings and fences accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

D. Unless intended for field welded connection, do not weld, cut, or abrade surfaces of railing or fence components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

E. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

F. Align rails and top and bottoms of fencing so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

G. Adjust railings and fence frames before anchoring to ensure matching alignment at abutting joints.

H. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and fences for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing and fencing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2

inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

3.3 ANCHORING RAILING POSTS

A. At locations indicated form or core-drill holes not less than 6 inches deep and 3 inch diameter for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. At locations indicated anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. Weld flanges to posts and bolt to concrete or metal-supporting surfaces.

3.4 ANCHORING FENCE POSTS

A. Form or core-drill holes not less than 12 inches deep and 4 inch diameter or as required to provide structural stability to resist the design loads for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Extent and Testing Methodology: Testing agency will randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Railings will be tested according to ASTM E 894 and ASTM E 935 for compliance with performance requirements.

C. Remove and replace railings and fences where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to the Commissioner and will comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 ADJUSTING AND CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.7 PROTECTION

A. Protect finishes of sand fencing from damage during construction period with temporary protective coverings approved by railing or fencing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 70 00

SECTION 07 92 00

JOINT SEALANTS

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Urethane joint sealants.

2. Pre-molded joint seal.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data: For each joint-sealant product.

C. 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.

D. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch (13-mm) wide joints formed between two 6-inch (150-mm) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.5 INFORMATIONAL SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Qualification Data: For qualified testing agency.

C. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.

2. Manufacturer and product name.

3. Type of substrate material.

4. Proposed test.

5. Number of samples required.

E. Preconstruction Laboratory 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 are needed for adhesion.

F. Field-Adhesion-Test Reports: For each sealant application tested.

G. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Engage a single manufacturer who shall provide the service of a Technical Representative who shall assist Contractor and Commissioner by providing technical opinion on the adequacy of materials and methods of installation based on Working Drawing approved by Commissioner.

B. Installer Qualifications: A representative who is properly trained by manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.

3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with stone substrates.

4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.

5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.

7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

1.8 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 ° F (5 ° C).

2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

1. Disintegration of joint substrates from causes exceeding design specifications.

2. Mechanical damage caused by individuals, tools, or other outside agents.

3. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART II – PRODUCTS

2.1 JOINT SEALANTS, 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 joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Commissioner from manufacturer's full range.

2.2 MATERIALS AND MANUFACTURERS

A. Exterior and Interior Joints in Vertical Planes: Urethane, M, NS, 25, NT;Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Use NT.

1. Sealants to comply with the following:

a. FS TT-S-00227: Type 2 (non-sag) Class A.

b. Adhesion-in-Peel: FS-TT-S-00227 and ASTM C794: Minimum 10 lbs/linear inch with no adhesion failure.

c. Hardness (Standard Conditions), ASTM C661:20-25 (Shore A).

d. Stain and color change, FS TT-S-00227 and ASTM C510: No discoloration or stain.

e. Accelerated Aging, ASTM C793: No change in sealant characteristics after 250 hours in weatherometer.

f. Rheological Vertical Displacement at 120 F, FS-TT-S-00227: No sag.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. Dymeric 241 by Tremco Incorporated, an RPM company.

   b. Sikaflex-2C NS by Sika Corporation.

   c. Or approved equal.

B. Exterior and Interior Joints in Horizontal Planes, Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade P, Class 25, Uses T and NT.

1. Sealants to comply with the following:

   a. FS TT-S-00227: Type 1 (self-leveling) Class A.

   b. Water Immersion Bond, FS-TT-S-00227: Elongation of 25% with no adhesive failure.

   c. Hardness (Standard Conditions), ASTM C661: 30-40.

   d. Stain and color change, FS TT-S-00227 and ASTM C510: No discoloration or stain.

   e. Accelerated Aging, ASTM C793: No change in sealant characteristics after 250 hours in weatherometer.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. Sikaflex-2C SL by Sika Corporation.

   b. Tremco Incorporated; THC 900/901.

   c. Or approved equal.

C. Premolded Joint Seal Between Vessel and Gangway

1. The premolded joint seal shall be a resilient, non-extrudable, impermeable closed cell, cross-linked, ethylene vinyl acetate, and low density polyethylene copolymer, nitrogen blown foam which is weather and wear resistant. The seal shall be shop marked to indicate the top side of the seal in such a way to be clearly visible upon installation.

2. The premolded joint seal shall be impervious to water penetration, be capable of handling a working movement range of 60% compression and 30% tension. The physical and chemical properties of the material shall not alter significantly within the temperature range of -94°F to 160°F.

3. The seal shall be manufactured with grooves along the bond surface running the length of the joint. The grooves shall be 1/8" ± wide by 1/8" ± deep and spaced between 1/4" and 1/2" apart. The depth of the seal shall be as recommended by the manufacturer, but shall not be less than 70% of the uncompressed width. The seal shall be designed so that, when compressed, the center portion of the top will not extend upward above the original height of the seal by more than 1/4". Splicing of the seal shall be done using the heat welding method by placing the joint and material ends against a teflon heating iron of 350°F for 7-10 seconds, then pressing the ends together tightly. Do not test the welding until the material has completely cooled. A watertight seal shall be provided along the entire length including the ends of the seal.

4. Premolded Joint Seal shall meet the following requirements:

   a. Flexible, closed-cell, cross-linked polyethylene (ASTM D1056, Type 2, Class B, Grade 2.

   b. Tensile strength (ASTM D3575, Suffix: T): 115 psi ± 15 psi.

   c. Tear resistance (ASTM D624): 21.5 lbs/in ± 5 lbs/in.

   d. Elongation at break (ASTM D3575, Suffix: T): 255% ± 20%.

   e. Extrusion at 60% Compression (ASTM D545): 0.25 inch (maximum).

   f. Working movement range beyond normal dimension: 30% ± 5%.

   g. Recovery (ASTM D545): 98.9% ± 10%.

   h. Water absorption (ASTM D3575, Suffix: L): 0.02 psf (average).

   i. Density (ASTM D3575, Suffix: W, Method A): 2.7 pcf to 3.2 pcf.

   j. Dimensional tolerances: Depth: +10% to -5%, Width: +2% to -2%.

   k. Color: sandy beige.

5. Epoxy Adhesive

   a. The adhesive to be used with the seal shall be two components, 100% solid, modified epoxy adhesive capable of bonding to dry or moist surface meeting the requirements of ASTM C881, Type 1, Grade 3, Class B & C and ACI 503.2.

   b. Epoxy adhesive shall meet the following requirements:

      1) Tensile strength (ASTM D638): 3,500 psi (minimum)

      2) Compressive strength (ASTM D695): 9,000 psi (minimum)

      3) Bond strength (AASHTO T237-73): 550 psi (minimum)

4) Compressive modulus (ASTM D695): 600,000 psi (minimum)

5) Elongation at break (ASTM D638): 1% (minimum)

6) Shore D hardness (ASTM D2240): 85 (minimum)

7) Water absorption by weight (ASTM D570): 1.0% (maximum).

6. Products:

a. Premolded Joint Seal:

1) Phyzite 380 with Hindered Amine Light Stabilizer (H.A.L.S.) by Chase Construction Products, or approved equal.

b. Epoxy Adhesive:

1) Eva-Pox Fresh Concrete Bonder No. 2 by Chase Construction Products, or approved equal.

2.3 JOINT SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Construction Chemicals, LLC, Building Systems.

b. Construction Foam Products, a division of Nomaco, Inc.

c. Or approved equal.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and 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. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. 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 to joint substrates.

B. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART III – 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 performance of the Work.

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 all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete

    b. Masonry

    c. Unglazed surfaces of ceramic tile

    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.

4. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless sealant manufacturer's written instructions indicate that alkalinity does not interfere with sealant bond and performance:

    a. Etch with 5 percent solution of muriatic acid.

b. Neutralize with dilute ammonia solution.

c. Rinse thoroughly with water and allow to dry before sealant installation.

5. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

a. Metal

b. Glass

c. Porcelain enamel

d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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 or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and 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 sealants using proven techniques that 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 in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Install sealants to the depths as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead.

1. For horizontal joints in sidewalks, pavements and similar locations sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75 percent of joint width, but not more than 5/8-inch deep or less than 3/8-inch deep.

2. For vertical joints subjected to normal movement and sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50 percent of joint width, but not more than ½-inch deep or less than ¼-inch deep.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.

2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.

b. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.

b. Whether sealant dimensions and configurations comply with specified requirements.

c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

C. Water Leaks: After nominal cure of exterior joint sealants which are exposed to the weather, test for water leaks. Flood the joint exposure with water directed from a ¾-inch garden hose, without nozzle, held perpendicular to wall face, 2 feet -0 inch from joint and connected to a water system with 30 pounds per square inch minimum normal water pressure. Move stream of water along joint at am approximate rate of 20 feet per minute. Test approximately 5 percent of total joint system, in locations which are typical of every joint condition, and which can be inspected easily for leakage on opposite face. Conduct test in the presence of Commissioner, who will determine the actual percentage of joints to be tested and the actual period of exposure to water from the hose, based upon the extent of observed leakage, or absence thereof.

3.5 CLEANING

A. Clean off excess sealant 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.

3.6 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 22 10 00
PLUMBING PIPING AND VALVES

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.

B. Related Work specified in other sections includes, but is not limited to, the following:

1.	Specification 01 45 50	-	Leakage Test
2.	Specification 31 23 16	-	Excavation – Earth and Rock
3.	Specification 31 23 23	-	Backfilling
4.	Specification 33 05 50	-	Laying and Jointing Buried Pipelines
5.	Specification 33 13 00	-	Disinfection
6.	Specification 40 05 18	-	Miscellaneous Pipe and Fittings
7.	Specification 40 05 20	-	Valves

1.2 SECTION INCLUDES

A. Furnishing and installing pipe, fittings, valves, accessories, specialties as shown, specified or required for a complete installation and satisfactory operation. Provide pipe and fittings of new materials, protected from dirt, moisture and mechanical damage.

1.3 REFERENCES

A.	ASME	-	Boiler and Pressure Vessel Code
B.	ASSE 1010	-	Water Hammer Arrestors
C.	ASTM A 518	-	Specification for Corrosion Resistant High Silicon Iron Castings
D.	ASTM D 2657	-	Practice for Heat Joining of Polyolefin Pipe and Fittings
E.	ASTM D 4101	-	Specification for Propylene Plastic Injections and Extrusion Materials

F. PDIWH 201 - Water Hammer Arrestors

G. NYC DOB - Plumbing Code

1.4 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Product Data and Information: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalog information and indicate valve data and ratings.

C. Shop Drawings: Provide shop drawings showing the following:

1. Layout of pipes, fittings, supports, valves and equipment.

2. Sections showing elevations of pipes, fittings, supports, valves and equipment.

3. Pipe size, type, material and schedule.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all products and materials as specified in DDC General Conditions and as follows:

1. Accept valves on site in shipping containers with labeling in place. Inspect valves for damage.

2. Provide temporary protective coating on cast-iron and steel valves.

3. Provide temporary end caps and closures on piping and fittings. Maintain end caps in place until installation.

4. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted as an "or approved equal".

1. Check Valves - Lift Type
   a. Combination Pump Valve Co.
   b. Smalensky Valve Co.

c. Williams-Hager

2. Check Valves - Clapper Type

a. Valve and Primer Corp. - "Apco"
b. Flomatic Corp.
c. Weir SPM

3. Ball Valves

a. Stockham - Model S-216BR-R-T
b. Crane - Model 9302
c. Nibco - Model T-585-70

4. Hose Bibbs

a. Chicago Faucet Co. - Model No. 387-E27
b. The Speakman Co.
c. Clow Valve Co.

5. Yard Hydrants

a. Josam - Series 71600
b. Wade - W-8609
c. Clow Valve Co.

6. Shock Absorbers

a. Josam - "Absorbatron"
b. Wade - "Shokstop"
c. Zurn - Shoktrol"

7. Backflow Preventers

a. Hersey Products, Inc. - Model FRP II
b. Watts Regulator Co. - Series 909
c. Zurn Wilkins

8. Pipe Sleeves

a. Thunderline Corp. - "Link Seal "Model WS".

b. The Metraflex Corporation, Metraseal, Chicago, IL
c. Flexicraft Industries (the Pipe Seal), Chicago, IL

2.2 MATERIALS

A. Pipe, Tubing and Fittings: Provide pipe, tubing and fittings as follows:

1. Provide ductile iron pipe and fittings complying with requirements specified in Section 33 05 55.

2. Provide cast iron pipe and fittings complying with requirements specified in Section 40 05 18.

3. Provide PVC pipe and fittings complying with requirements specified in Section 40 05 18.

4. Provide copper tubing and fittings complying with requirements specified in Section 40 05 18.

B. Chemical-Resistant Pipe and Fittings: Provide chemical-resistant pipe and fittings as follows.

1. Silicon-Iron Alloy Hub and Spigot Pipe: ASTM A 518, extra heavy.

a. Fittings: Silicon-Iron Alloy.
b. Joints: Lead and acid-resistant packing.

2. Polypropylene Pipe: ASTM D 4101, Schedule 80

a. Fittings: Heavy-duty
b. Joints: ASTM D 2657 solvent fusion

C. Valves: Provide valves meeting the requirements of Section 40 05 20, except as specified herein.

1. Provide valves recommended by their manufacturer for the conditions of use as installed, and capable of tight shutoff under those conditions. Provide valves recommended for a fluid operating temperature up to 250 degrees F.

2. Provide valves in insulated pipes with an extended neck to clear the insulation.

3. Provide combination temperature and pressure relief valves at the domestic water heaters meeting the requirements of the ASME pressure temperature rating.

4. Provide a chromium-plated stop valve with handwheel at an accessible location on each water connection at each plumbing fixture.

5. Provide screwed pattern and soldered pattern valves with unions to facilitate removal from the pipe.

6. Provide accessible pressure rated 3/4-inch hose-end gate valves at low points for draining each water piping system.

7. Check Valves - Lift Type: Provide check valves in closed system vertical pipes with 125 psi SWP, nonslam guided lift type, bronze screwed pattern for valves 2 inches and smaller, and flanged-iron body bronze mounted for valves 2-1/2 inches and larger.

8. Check Valves - Clapper Type: Provide check valves in sump pump or sewage ejector discharge lines of the integral nonmetallic clapper type or the plastic ball type, opening out of the flow path, closing nonslam, and specifically recommended for sewage service by their manufacturer.

9. Ball Valves: Provide a screwed pattern 2-piece brass or bronze ball valve rated at 125 psi minimum, precision ground, free floating ball, stem shoulder preventing blowout, reinforced teflon stem seals and seats, and a rustproof handle with stop clearing the pipe insulation.

10. Balancing Valves: Provide the domestic hot water return circuit with a balancing valve to set flow rate of either the automatic flow control type or the manual adjustment type. Provide the balancing valve with integral flow measuring taps, or in conjunction with a flow measuring device for use in verifying or adjusting the flow rate.

    a. Provide automatic flow control valves complete with pressure taps, nipples and capped quick disconnect valves for connection of flow measuring instrumentation. For valves 2 inches and smaller provide screwed pattern valves with gray iron valve bodies rated for 125 psi working pressure.

        (1) Provide factory calibrated, direct acting, automatic pressure compensating type automatic flow control valves, with stainless steel cartridge and spring. Provide valves with an accuracy of plus or minus five percent of rated flow regardless of system pressure fluctuations of up to 20 psi. Size all automatic flow control valves in accordance with the flow capacities.

        (2) Provide a union at each automatic flow control valve. Provide each valve with a metal tag chained in place and stamped with the valve model number, rated flow in gpm, differential pressure range and zone or unit identification. Provide pressure measuring equipment, including a 4-1/2 inch dial pressure gauge, carrying case, hoses, connections, three-way push button operated valve, flow conversion chart and instructions.

D. Hose Bibbs: Provide exterior hose bibbs (HB-1) with 3/4-inch hose thread outlet, lockshield cap, removable tee handle, 3/4-inch threaded female inlet flange, and 3/4-inch spout outlet in-line vacuum breaker for back-siphonage protection.

E. Yard Hydrants: Provide yard hydrants (YH-1) of cast-bronze nonfreeze box type with T-handle, polished face, hinged locking cover, neoprene plunger, bronze operating parts, bronze casing and straight inlet with standard hose connection.

F. Pipe and Valve Identification: Identify all pipelines and valves in accordance with the Section 40 05 20.

G. Hangers and Supports: Provide hangers and supports as specified in accordance with the Contract Documents.

H. Shock Absorbers: Provide each shock absorber meeting the requirements and be sized no smaller than recommended by Plumbing and Drainage Institute "Standard WH201" as ASSE Standard 1010. Isolate each absorber from the piping system by a ball valve, locate accessible for service, and prevent "water hammer" by absorbing surge pressures created by the quick-closing valve(s). Construct absorber of stainless steel or other material which is nonrusting, and include a wetted bellows contained in a pressurized chamber and rated for 150 psi working pressure.

I. Escutcheons: Provide chrome nickel-plated brass escutcheons, sized to fit over the pipe and its insulation, at locations where exposed pipes penetrate finished surfaces.

J. Cleanouts: Provide cleanouts meeting the following requirements.

1. Floor Cleanouts in Finished Rooms: Provide floor cleanouts in finished rooms with an adjustable cast-iron floor cleanout installed flush with finished floor, with cutoff sections, brass internal plug, satin finish nickel alloy top, and with secured cover.

2. Floor Cleanouts in Unfinished Rooms: Provide floor cleanouts in unfinished rooms with a satin finish brass top, and secured heavy-duty brass cover.

3. Cleanouts on Exposed Piping: On exposed risers and horizontal piping provide cleanouts with cast-brass, with countersunk, iron pipe size male threaded plug.

4. Cleanouts on Concealed Piping: On concealed risers provide cleanouts with cast-brass, countersunk, with stainless steel round access cover plate secured to plug with countersunk screw.

K. Backflow Preventers: Provide backflow preventers of the reduced pressure type with two check valves, an automatically operating pressure differential relief valve located between the two check valves, and three test cocks for testing purposes.

1. Construct all moving parts and trim of corrosion-resistant materials with neoprene valve discs.

2. Provide each backflow preventer assembly complete with a strainer on the inlet side, and gate valves at both inlet and outlet sides.

3. Provide backflow preventers suitable for a maximum working pressure of 175 psi, and water temperatures from 32 to 145 degrees F.

PART III - EXECUTION

3.1 INSTALLATION

A. Piping Installation: Install plumbing piping clear of all building elements.

1. Pitch drain-line piping uniformly downward in the direction of flow not less than 1/8-inch per lineal foot.

2. Review elevations before proceeding with the Work, and the location, depth and size of sewers before connections are made.

3. Before running any drains and sewers within buildings, or any vent or drain stacks, or any water lines, verify that they can be run without trapping, sagging or interfering with columns, beams, piping, fixtures, ducts, or other system components. Coordinate necessary changes before pipes are installed.

4. Pitch horizontal water pipes to facilitate draining through drain hose valves installed at low points.

5. Pitch compressed air piping uniformly downward in the direction of flow not less than 1-inch in 40 feet, with drain valves provided at low points. Extend branch lines from the top of horizontal mains. Provide automatic traps with drains extended to the nearest floor drains at low points and dead ends.

6. Flash pipes passing through the roof watertight with 4-pound per square foot sheet lead, except as otherwise shown. Extend flashing out on the roof not less than 18 inches from the pipe or edge of drain in all directions, and turn down into vent pipes.

B. Shock Absorbers: Install shock absorbers on each water pipe supplying solenoid valves or other automatic or manual quick-closing valves.

C. Air Chambers: Provide air chambers in water piping at the top of upfeed risers, and in branch pipes at plumbing fixtures and other water appliances.

1. Install air chambers in a direct line with the flow of water through such pipes of sufficient capacity to provide an air cushion which will absorb shock, stress or strain caused by the operation of valves or faucets in the water supply system.

2. Provide air chambers constructed of the same pipe to which they are connected and not less than 18 inches in length, except for air chambers on each water supply branch connection to individual plumbing fixtures which is not less than 12 inches in length.

D. Cleanouts: Provide cleanouts at ends of mains, each change in direction of more than 45 degrees, spaced not more than 50 feet apart in all straight runs, and at the base of all soil stacks, downspouts, and fixture traps. Terminate cleanouts for concealed pipes flush with finish floor, wall or grade with trim as specified. Provide cleanouts of the same size as the pipe up to 4 inches in diameter, and 4-inch size for larger pipes and located for convenient access.

E. Backflow Preventers: Install backflow preventers where shown and where necessary to prevent contamination of the City water supply caused by possible cross-connection with a contaminated source. Pipe the relief valve vent to discharge over the nearest floor drain.

F. Sound and Vibration Control: Arrange and install all equipment and piping to avoid noise transmission to the structure or to other piping. Correct or replace any installation giving an unacceptable noise or vibration level, as required, at no additional cost to the City of New York.

1. Provide flexible electrical and piping connections to vibration isolated equipment. Provide flanged stainless steel bellows connectors with braided sleeve in each pipe connected to such equipment.

G. Pipe Expansion Provisions: Connect, support and guide piping to permit and control pipe expansion and contraction and to accommodate building expansion, contraction and settling without damage.

1. Provide piping expansion loops or expansion joints sized to accommodate possible expansion without exceeding allowable pipe and fitting stresses in straight sections of hot water piping more than 50 feet in length. Locate expansion devices midway between anchor points, and the pipes guided as recommended. Provide pipe loop legs, cold sprung at the time of assembly to one-half the calculated maximum expansion.

2. Provide expansion joints of the guided, restrained, multiply Type 316 stainless steel bellows type guaranteed for at least 15,000 cycles, with rated capacity equal to twice the calculated pipe expansion.

3. Provide anchors for piping within a structure consisting of welded plates, angles, channels, or beams braced and securely fastened to the pipe and to structural members adequate to safely withstand resulting stresses.

H. Pipe Sleeves: Provide steel pipe sleeves for pipes piercing concrete and masonry construction. Install pipe sleeves with welded water stop plates in floors, exterior walls and foundation walls.

1. Seal watertight insulated and uninsulated lines installed in the pipe sleeves with an elastic mechanical pipe sleeve seal of size and service designation as recommended by the manufacturer for proper sealing.

2. Furnish appropriate fire-rated sleeve seal and insulated pipe protectors for fired rated walls and floors.

3.2 FIELD QUALITY CONTROL

A. Tests: After installation of the piping, control equipment and all appurtenances, subject each unit to a field running test as specified in the DDC General Conditions, under actual operating conditions and requirements of Section 01 45 50.

B. Disinfection: Disinfect pipelines that convey potable water in accordance with the requirements of Section 33 13 00.

3.3 CLEANING AND PAINTING

A. Clean and paint pipe, valves and fittings subject to rust before rusting occurs.

B. Do not paint bright metal parts, such as fixtures, connections, escutcheons, fittings, knobs and nameplates, and thoroughly clean and polish same just before the completion of the Work.

END OF SECTION 22 10 00

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SECTION 26 05 00
GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: General requirements for providing basic electrical materials and methods.

B. Provide all labor, materials and equipment required to perform the work as specified in the Contract Specifications and shown on the Contract Drawings. Related work specified in other sections includes, but is not limited, to the following:

1. Certain equipment, control devices, conduit and wiring are shown on electrical drawings, but are specified in other sections pertaining to plumbing, heating, ventilating, air conditioning, temperature control systems, process equipment, process control systems and instrumentation. Install and connect these items to the electrical system as indicated or required in accordance with the Contract Documents.

C. Overall Application of Specifications: This Section applies to all Division 26 sections and to other sections that include requirements for electrical equipment. Irrespective of where the electrical requirements are specified, provide and install all materials necessary for a complete operational system.

D. Temporary Requirements: This Section applies to any temporary circuits, overcurrent devices, conduit, wiring, and other equipment required. This Section also applies to temporary rewiring of lighting circuits, power circuits and devices.

E. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done at no additional cost to the City and provided that all requirements of these specifications are fulfilled.

1.03 REFERENCES

A. General electrical requirements shall comply with the latest applicable provisions and recommendations of the following:

1. NEMA, National Electrical Manufacturers Association.

2. UL, Underwriters Laboratories Incorporated.

3. New York City Electrical Code

4. New York City Building Code

5. New York City Energy Conservation Code

1.04 SYSTEM DESCRIPTION

A. Engineering Requirements: Engineering requirements are specified in the applicable sections.

B. Performance Requirements: Performance requirements are specified in the applicable sections.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data and Information: Furnish a complete list of electrical equipment and materials to be furnished that shows the manufacturer, catalog number, size, type, capacity, voltage rating and other pertinent information related to each item on the list.

1. Furnish catalog data for the manufacturer's standard equipment and materials. Clearly identify the equipment and devices specifically being proposed on manufacturers' catalog data sheets.

2. Identification: Furnish a complete schedule or listing of system and equipment identification labels with legends.

C. CONTRACTOR's Shop Drawings: Furnish shop drawings on items manufactured for the Contract.

1. Furnish connection and schematic diagrams for each piece of electrical equipment where applicable. A manufacturer's standard connection or schematic diagram showing more than one method of wiring is not acceptable unless, the intended method is clearly marked.

2. Furnish diagrams that show connections to field equipment. Clearly differentiate between manufacturer's and field wiring.

3. Furnish raceway layout drawings that show conduits, boxes, and panels which contain the conductors to be provided. Include schedules listing conduit sizes, conductor content and identification.

D. Record Documents: Furnish record documents, and in addition to the requirements specified in DDC General Conditions, indicate installed conditions for:

1. Interior and exterior major raceway systems' sizes and locations; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker sizes and arrangements.

2. Exposed and concealed equipment locations dimensioned from prominent building lines.

3. Approved substitutions, and actual equipment and materials installed.

E. Maintenance Manuals: Furnish maintenance manuals, and in addition to the requirements specified in the DDC General Conditions, include the following information for equipment items:

1. Functional description, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and catalog numbers of replacement parts. Where a Bill of Materials is provided, include a manufacturers' data sheet for each component and device listed therein.

2. Manufacturer's printed operating procedures.

3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

1.06 QUALITY ASSURANCE

A. General:

1. Properly connect all equipment and devices, provided under each Contract, with other equipment and devices so as to render the installations complete for successful operation, regardless of whether all the connections and interconnections are specifically mentioned in the Specifications or shown on the Contract Drawings.

2. Provide similar products by the same manufacturer for uniformity on the Contract.

3. Codes: Provide all electrical Work in accordance with applicable local codes, regulations and ordinances. If there is a conflict between the requirements specified in the Contract Documents and the codes, follow the more stringent requirements as determined and approved.

4. Testing: As a minimum, provide standard factory and field tests for each type of equipment. Other tests may be specified in the applicable equipment section.

5. Labeling: Provide electrical equipment and materials that are listed and approved by Underwriters Laboratories or other OSHA recognized testing laboratories with the testing agency's label attached.

B. Area Classifications:

1. Corrosive Areas: For all outdoor areas, provide materials and equipment conforming to corrosive requirements.

2. The locations and requirements shall be in accordance with the following:

a. Materials, equipment and incidentals installed in corrosive areas shall meet NEC and NEMA requirements for corrosive locations. Enclosures installed in corrosive locations shall meet NEMA 4X requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

B. Shipping and Packing: Provide materials and equipment suitably boxed, crated or otherwise completely enclosed and protected during shipment, handling, and storage. Clearly label such boxes, crates or enclosures with manufacturer's name, and name of material or equipment enclosed.

C. Acceptance at Site: Conform to acceptance requirements as required in the DDC General Conditions.

1. Repair or replace all materials and equipment damaged by handling and storage as directed at no additional Contract cost.

D. Storage and Protection: Protect materials and equipment from exposure to the elements and keep them dry at all times. Handle and store to prevent damage and deterioration in accordance with manufacturer's recommendations. Provide temporary power to space heaters where provided with equipment to prevent condensation from developing.

1.08 PROJECT CONDITIONS

A. General: The Drawings indicate the extent and general arrangement of the principal electrical elements, outlets, devices and circuit layouts. Install and connect all electrical elements and devices to form a complete workable system as required by the Contract Documents, regardless of whether all system components are specifically stated in the Specifications or shown. Provide necessary materials and installation wherever required to conform to the specific requirements of the furnished equipment and for proper installation of the Work.

B. Physical Layouts: In general, the routing of feeders show general arrangement and are not intended to show exact routing and locations of raceways. Verify actual and final arrangement, equipment locations, and prepare circuit and raceway layouts before ordering materials and equipment. Equipment locations are approximate and are subject to modifications as determined by approved equipment dimensions.

C. Departure from Design: If departures from the design are deemed necessary due to structural conditions, obstructions or other problems, provide details of such departures and the reasons for requesting approval. Submit variations as soon as practical but no later than the submittal of the required raceway layout drawings. Do not depart from the design without written approval.

D. Existing Cables and Conduits

1. Where new construction involves connecting to or using existing equipment, Should an existing condition prove to be grossly deteriorated or inadequate for modification, report such condition to the City of New York and Commissioner for a remedy

2. Where existing empty conduits are to be used for new wiring systems, assume that they are in poor condition requiring prior "make ready" work before using. Pull a wire brush reamer through prior to wiring and pump or blow out water accumulations if necessary.

3. Trace and tag all wires before these are relocated and reconnected from the equipment. Coordinate removal of wires with the Commissioner.

1.09 INTERIM AND TEMPORARY MATERIAL AND EQUIPMENT

A. Furnish, install and remove the interim material and equipment in accordance with the Contract Documents.

B. Remove all interim material and equipment and disposal thereof from the site in accordance with the Specifications.

C. Furnish temporary material and equipment is material and equipment based on method of construction for maintaining the utility or service systems during the installation or connection of new equipment or material.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 ROUGH-IN

A. Final Location: Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

3.02 ELECTRICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate electrical systems, equipment, and materials installation with other building components.

2. Verify all dimensions by taking field measurements.

3. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations,

franchised service companies, and controlling agencies. Provide all required connections for each service.

4. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the COMMISSIONER for resolution.

5. Provide electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

3.03 DEMONSTRATION OF EQUIPMENT

A. Demonstrate in the presence of the Commissioner, that all electrical systems and electrically operated equipment operates as specified, designed and as required.

B. Lighting and Receptacle Systems

1. Operate all lighting systems to verify proper switching and proper circuit wiring.

2. Verify receptacle circuit wiring to agree with panelboard schedules.

3.04 FINISHES

A. Clean exposed ferrous metal surfaces except aluminum, bronze, brass and stainless steel components with a commercial blast and primed with one coat of rust inhibitive primer.

B. Field paint marred or scratched surfaces after installation. Touch up all scratches, abrasions and other damage to equipment.

END OF SECTION 26 05 00

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SECTION INCLUDES

A. Section Includes: Requirements for providing all wires and cables rated at 600 volts and below for complete electrical systems as shown, including all accessories.

1.03 REFERENCES

A. Codes and standards referred to in this Section are:

1. City of New York Electrical Code
2. ASTM B 3 - Standard Specifications for Soft or Annealed Copper Wire
3. ASTM B 8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
4. TIA/EIA 568-B - Commercial Building Telecommunications Cabling Standard
5. UL Standard No. 44 - Wires and Cables, Rubber-Insulated.
6. UL Standard No. 83 - Wires and Cables, Thermoplastic-Insulated.
7. UL Standard 486A - Wire Connectors and Soldering Lugs for Use With Copper Conductors.

1.04 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data and Information: Furnish manufacturer's catalog data for each type of wire and cable furnished.

C. Working Drawings:

1. Prior to equipment submission, submit a list of proposed manufacturers with the products they produce proposed for the contract.

2. Provide manufacturer's literature, specifications and engineering data for the electric wires and cables and accessories.

3. Submit description of shop and field testing methods, procedures and apparatus with calibration dates at least 45 days prior to conformation of witness testing dates and actual testing.

4. Submit qualifications of proposed testing firm to perform acceptance testing. Submit firm experience records at least 45 days prior to actual testing, recent references with phone numbers shall be submitted.

5. Submit qualifications of proposed mineral-insulated metal sheath cable installer. Submit installer experience records with recent completed installations with names and phone numbers.

6. Submit certification from the mineral-insulated metal sheath cable manufacturer's representative indicating that the cable installation is in accordance with the manufacturer's requirements.

D. Reports:

1. Provide shop and field test reports.

2. Provide acceptance testing report.

E. Material Safety and Data Sheets

1. Material Safety and Data Sheets (MSDS) shall be submitted for all cables and wires supplied. MSDS shall be submitted with the equipment shop drawings.

1.05 QUALITY ASSURANCE

A. General:

1. General: Furnish wire and cable in accordance with applicable IEEE and NEMA standards and meeting the applicable requirements of the NEC and UL.

2. All cables and wires shall be made by an approved manufacturer, and in their construction shall be employed the most improved commercial materials and processes of manufacture.

3. Only electrical wiring manufactured under high standards of production and meeting the approval of the Commissioner shall be used. Friction tape shall be in accordance with ASTM Des. D69.

4. The wire and cable manufacturer shall use a shop test facility that has recently calibrated testing apparatus and qualified, experienced technicians, for all shop tests. Calibration of testing apparatus shall be within one year.

5. All test equipment and instrument calibration shall be in accordance with the latest edition of the accuracy standard of the U.S. National Institute of Standards and Technology and the NETA acceptance testing specification.

6. The mineral-insulated metal sheath cable installation shall be performed by experienced mineral-insulated metal sheath cable installers who shall have been regularly engaged in the installation of mineral-insulated metal sheath cable for a minimum of the past three years.

7. Retain the services of the mineral-insulated metal sheath cable manufacturer's representative to certify the cable installation is in accordance with the manufacturer's requirements.

B. Field Tests:

1. Field test electric wires and cables for 600 volt and below wires and cables in accordance with the requirements specified under Article 3.05 of this Specification Section.

2. Retain the services of an independent testing firm who shall perform acceptance testing on the medium voltage wire and cable installation. The testing firm shall have experience in the inspection and testing of cables of the type specified and shall be a member company of NETA. Provide proof of membership or demonstrate that the standards and experience required for membership are possessed, all to the satisfaction of the Commissioner.

3. Tests: Furnish factory tested cables prior to shipment in accordance with ICEA standards for the insulation specified.

1.06 DELIVERY, STORAGE AND HANDLING

A. Electric wires and cables shall be delivered, stored and handled in accordance with the Detailed Specifications and the manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Wire and Cable

a. American Insulated Wire Corporation

b. Southwire Company

c. The Okonite Company

2. Multiconductor Cable

   a. The Okonite Company

   b. Southwire Company

   c. Belden

3. Wire Connectors

   a. Thomas & Betts

   b. 3 M/Electrical Products Division

   c. Ideal Industries

4. Color Coding Marker

   a. W. H. Brady Company

   b. Thomas & Betts

   c. 3M

5. Pulling Compound

   a. Ideal Industries

   b. Greenlee

   c. 3M

2.02 600 VOLT INSULATED WIRE AND CABLE

A. Conductors: Provide soft drawn or annealed copper conductors with 98 percent minimum conductivity, meeting requirements of ASTM B 3 (solid) or ASTM B 8 (stranded). Use stranded conductors except solid No. 12 and No. 10 AWG may be used in lighting fixture and convenience outlet wiring.

B. Refer to the conduit and cable schedule for the size and quantity of wires and cables. The conductor jacket shall be in accordance with color identification requirements specified under Article 3.03.

C. Single conductor: Provide wire and cable for installation in conduit in accordance with the following:

   1. Stranded copper, single conductor cable conforming to ASTM B8, and B33, No. 12 AWG minimum size.

2. Insulation: Flame-retardant, moisture and heat resistant thermoset rated 90 degrees C in dry locations and 75 degrees C in wet locations and listed by UL as type XHHW or RHW.

3. Provide XHHW-2 for all indoor circuits and RHW for all underground and outdoor circuits.

D. Multiconductor Cables: Insulate individual conductors with 15 mils of polyethylene or PVC and 4-mil nylon jacket. Wrap the conductors with type binder and an outer jacket not less than 45 mils of PVC. Use ICEA Method 1 for color coding wires.

2.03 600 VOLT AND BELOW WIRE AND CABLE ACCESSORIES

A. Cable connectors shall be provided for terminating 600 volt and lower voltage wire and cable. Connectors for wire and cable up to 600 volt shall be solder less type and properly sized to fit fastening device and wire size. Connectors shall be in accordance with the following:

1. For wire sizes up to and including No. 6 AWG, compression type with UL 486A listing shall be used. All cable terminations for conductors No. 10 AWG and smaller shall be terminated using UL listed ring tongue type, nylon insulated connectors, at each terminal board.

2. For wire sizes No. 4 AWG and above, either compression type or bolted type with tin-plated contact faces shall be used.

3. For wire sizes No. 250 kcmil and larger, connectors with at least 2 cable clamping elements or compression indents and provision for at least 2 bolts for joining to apparatus terminal shall be used.

4. Compression connectors shall be Power-Connect, ring tongue shall be Series 83.

B. When terminals are not provided, perform cable splicing for 600 volt and below wire and cable in accordance with the following:

1. For wire sizes No. 8 AWG and larger, create splices with compression type copper splice fittings with UL 486A listing. Tape and cover splices with materials recommended by the cable manufacturers, to provide insulation equal to that on the conductors.

2. For wire sizes No. 10 AWG and smaller, create splices shall with preinsulated spring connectors that are flame retardant with UL listing.

3. For wet locations, provide UL listed, heavy wall type, waterproof splices. Waterproof compression type splices by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductor. Provide UL listed spring connector splices and waterproofed with a sealant-filler.

4. Provide thermo-shrink waterproof compression splices.

5. Provide spring connectors splices of Twister type and Twister DB type for waterproof.

C. Color Coding:

1. General: Use a vinyl impregnated cloth tape resistant to oil, dirt and heat for conductor color coding.

D. Provide pulling compound shall be to facilitate wire pulling in accordance with the following:

1. Provide UL listed pulling of either the waxed based type or water based. For low temperature installations, use a winter grade lubricant. Provide compound compatible with all jacket types. Use 0.35 inches as the coefficient of friction for pulling tension calculations.

2. Pulling compound shall be Ideal Industries, Greenlee or equal to be approved by the Commissioner.

2.04 WIRE CONNECTIONS AND CONNECTING DEVICES

A. Connectors for No. 10 AWG and Smaller: Provide insulated compression type butt connectors.

B. Connectors for No. 8 AWG and Larger: Provide UL, Inc. listed compression type tube connectors for parallel or butt splices. Provide companion preformed plastic insulating covers or tape to provide insulation equal to conductor insulation.

C. Miscellaneous Connectors: Provide preinsulated spring connectors for lighting and receptacle splices and pigtails.

D. Solderless Lugs: Provide solderless terminal lugs for stranded and multiple solid conductors at connection to terminals or use UL listed crimp tool compression style lugs.

E. Control Wire Terminations: Provide spade lug or pressure type control conductor connection terminations for control wiring terminations. Provide lug bolting at devices or bus bars with a flat washer, a Belleville washer and a locknut.

2.05 SHOP TESTS

A. Certified Shop Tests:

1. Perform shop testing on the wire and cable at the manufacturer's plant prior to shipment, in accordance with the latest revisions of ICEA and UL and shall demonstrate that the wire and cable tested conforms to the requirements specified.

2. Provide a shop test report identifying the tests and the results.

3. Perform all shop testing in accordance with the requirements of Underwriters' Laboratories.

B. Witnessed Shop Tests:

1. Perform witnessed shop tests.

2. Provide the Commissioner with access during working hours for inspection purposes to all parts of the works where material and cable are being manufactured, and all reasonable inspection and testing facilities shall be provided to him without increase in price. The Commissioner may request that dielectric strength tests and measurements be made to verify the cable data furnished by the Contractor. For this purpose, furnish without increase in price, a length of cable, not to exceed 3 feet for each size to be cut from one or more reels as directed by the Commissioner. Mark each sample with a tag bearing full description of cable insulation and number of reel from which it is cut.

PART 3 EXECUTION

3.01 GENERAL

A. General: Swab new and existing conduits to be used to clear debris and remove moisture before conductor installation. Install conductors in raceways with no splices between boxes.

B. Pulling Equipment: Pull conductors using proper equipment without exceeding manufacturer's recommendation for maximum pulling tension. Protect conductor insulation jacket at all times from twists, kinks, scrapes, punctures and other damage. Replace damaged conductors. Pull wires and cables into ducts and conduit without the use of lubricants, except where such use is necessary and approved by the cable manufacturer and the COMMISSIONER. Use UL listed lubricating compound compatible with the conductor insulated jacket and with the raceway.

C. Use lines of nylon or polypropylene, propelled by carbon dioxide, or compressed air, to snake or pull wire and cable into conduits. Do not use flat steel tapes or steel cables.

D. Do not exceed the manufacturer's recommended cable bending radii and pulling. Provide the number of conductors permitted in a conduit in accordance with the latest applicable section of the City of New York Electrical Code.

E. Conductor Support: Support conductors in vertical risers with woven grips to prevent loading on conductor connectors.

F. Conductor Sizing: Size conductors in accordance with the NEC, local codes having jurisdiction and the following:

1. Size for branch lighting circuits so that the greatest voltage drop between lighting panel and center of load does not exceed two percent at rated load.

2. Size conductors to limit the maximum conductor temperature to less than 75 degrees C, except where specifically stated otherwise.

3. Use minimum conductor sizes as follows:

   a. Power and lighting branch circuits, No. 12 AWG.

   b. 120-volt control circuits, No. 14 AWG.

   c. Instrumentation and signal wiring, 2 or 3 conductors No. 16 AWG stranded shielded.

4. Size conductors as shown or as required by the actual load to be served, whichever is larger.

3.02 INSTALLATION OF WIRING

A. Code Requirements: Install wiring in accordance with applicable provisions of City of New York Electrical Code, local codes having jurisdiction and as indicated.

B. Terminations: Leave a minimum of six inches of free conductor at each connected outlet and a minimum of nine inches at unconnected outlets.

C. Splicing: Install continuous cables without splices in all duct systems. Shield continuity shall be maintained. Ultimate shield termination (ground) shall be at one end only.

D. Do not make splices between terminals except at approved junction or terminal boxes. Provide boxes as shown on the Contract Drawings or as required by Code for the pull lengths. Do not make more than two terminations at each terminal point. Loop cable and wire runs through pull boxes without cutting and splicing where possible. Waterproof all splices below grade, in hand holes and wet locations.

E. Pull wire and cable contained within a single conduit simultaneously using insulating pulling compounds containing no mineral oil.

F. Install cables with maximum slack at all terminal points, boxes, and handholes.

3.03 CONDUCTOR IDENTIFICATION

A. Labeling: Label each wire at both termination points and at each splice point in junction boxes. Carry individual conductor or circuit identification throughout, with circuit numbers or other identification clearly stamped on terminal boards and printed on directory cards in distribution cabinets and panelboards.

B. Identification: Where the total number of control and signal wires is three or more and no terminal board is provided, identify each wire in junction boxes and cabinets by means of plastic slip-on wire marker.

C. Plastic Tags: In manholes, identify each wire by laminated plastic tag located so it can be easily seen from center of manhole without moving adjoining wires. Bundle and mark control wires as listed in conduit and cable schedule.

D. Color Coordination: Connect circuit conductors of the same color to the same phase throughout the installation.

E. Color Coded Tape: Apply color coding tape at all terminations and splices with overlapping turns for a minimum length of two inches, starting two inches back from the termination point. Provide color code tape in all boxes and manholes.

1. Provide color coding throughout the entire network for service, feeder, branch, control and low energy signal circuit conductors. Use the following color code for conductors.

COLOR CODING

SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND
208/120 three phase	Black	Red	Blue	White	Green
480/277 three phase	Brown	Orange	Yellow	White	Green

3.04 CONNECTOR AND TERMINAL LUG INSTALLATION

A. UL Requirements: Install all connectors and terminal lugs in accordance with UL requirements and manufacturer's recommendations.

3.05 600 VOLT AND BELOW WIRE AND CABLE FIELD TESTING

A. Furnish all testing equipment and perform field tests on all low voltage electrical wire and cable after installation, with witnessing by the Commissioner. Provide a report identifying the tests performed and the results obtained.

B. Test each electrical circuit after permanent cables are in place to demonstrate that the circuit and equipment are connected properly and will perform satisfactorily and that they are free from improper grounds and short circuits. Provide the tests per the following:

1. Individually test low voltage wire and cable mechanical connections after installation and before they are put in service with a calibrated torque wrench to ensure that the values are in accordance with manufacturer's recommendations.

2. Individually test low voltage wire and cables for insulation resistance between phase and from each phase to ground. Test after cables are installed and before they are put in service with a Megger for one minute at a voltage rating recommended by the cable manufacturer or in accordance with NEMA and ICEA standards.

3. Replace any cable not meeting the insulation resistance value recommended by the cable manufacturer or in accordance with NEMA and ICEA standards, or which fails when tested under full load conditions, with a new cable for the full length.

C. Provide all tests and values in an acceptance testing report for wire and cable in accordance with the manufacturer's recommendations and NETA, ATS Acceptance Testing Specification.

END OF SECTION 26 05 19

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: Requirements for providing a complete grounding system as specified and shown. Grounding includes but is not limited to: electric equipment enclosures, raceway systems, mini power center, panelboards, ground grid systems, grounding rods, grounding conductors, bonding jumpers, and structure metal frames as required.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 00 - General Electrical Requirements

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables

C. Section 26 05 33 - Raceway and Boxes for Electrical Systems

1.04 REFERENCES

A. Grounding shall comply with the latest applicable provisions and recommendations of the following:

1. Electrical Code of the City of New York.

2. UL Standard No. 467, Electrical Grounding and Bonding Equipment.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Working Drawings:

1. Prior to equipment submission, submit a list of proposed manufacturers with the products they produce proposed for the contract.

2. Furnish manufacturer's catalog data for the following:

a. Grounding and grounded conductors

b. Grounding connectors, clamps and bushings

c. Grounding rods

d. Bonding jumpers

3. Furnish shop drawings showing the locations and length of grounding rods. Denote the size and material used for grounding rods. Furnish details pertaining to the installation of grounding electrode conductors, grounding and grounded conductors, grounding connections, grounding enhancement materials and the ground grid for buildings, structures, lighting units, and handholes.

C. Quality Control: Furnish a field report stating the results of the system ground impedance test.

1.06 QUALITY ASSURANCE

A. Codes and Standards: Construct a complete grounding system in accordance with applicable ANSI, IEEE Standards, and the New York City Electrical Code.

B. Provide grounding system maximum resistance that does not exceed 5 ohms under normally dry conditions. Connect all structures and metal equipment containing electrical apparatus to ground.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in DDC General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Grounding and Grounded Conductors

a. American Insulated Wire Corporation

b. Southwire Company

c. Harger

2. Ground Plates

a. FCI Burndy Corporation

b. OZ/Gedney Company

c. Erico Products

d. Thomas & Betts

3. Grounding Rods

   a. Harger Lightning Protection, Inc.

   b. Thomson Industries, Inc.

   c. Carolina Galvanizing Utility Products Division

   d. Erico Products

   e. Superior Grounding Systems

4. Grounding Connectors

   a. Burndy

   b. Thomas and Betts

   c. Cadwell

5. Ground Rod Access and Test Well Box

   a. Hubbell Power Systems – Quazite

   b. Hartford Concrete Products, Inc.

   c. Thompson Lightning Protection

   d. Erico

2.02 GROUND CABLE

A. General: Provide conductor sizes as shown or required.

B. Materials: Provide conductors in accordance with the requirements specified in Section 26 05 19. Provide ground cable of soft drawn bare stranded copper conforming to ASTM B8 and B189, No. 8 AWG minimum size.

C. Insulated Conductors: Provide copper conductor with green color insulation rated at 600 volts where installed in conduits or other enclosed raceways.

D. Bare conductors: Provide bare copper conductor where buried in earth, embedded in concrete or exposed.

2.03 GROUND RODS

A. Length and Size: Provide grounding rods 3/4-inch in diameter and 10 feet long.

B. Grounding Rod Material: Stainless steel.

C. Provide ground rods with a drive point at the lower ends, the upper end of each rod shall be equipped with bronze, clamp type connectors with not less than four bolts.

2.04 GROUNDING CONNECTORS

A. Grounding Clamps and Bolted Connectors: Provide grounding clamps and bolted connectors suitable for devices or cables being connected

B. Provide heavy duty copper compression connectors. Provide copper alloy castings bolted connectors, designed specifically for the items to be connected, and assembled with Durium or silicone bronze bolts, nuts and washers.

C. Welding: Provide the exothermic welding process for buried, concealed and accessible connections to structural members, ground rods, and case grounds. Clean and paint welds embedded in the ground or encased in concrete with asphalt base paint.

D. Bolted Connectors: Provide bolted connectors for grounding to ground buses and equipment.

E. Grounding Bushings: Provide grounding bushings for conduits where conduits are not effectively grounded by firm contact to the grounded enclosure.

2.05 GROUNDING PLATES

A. Ground Plates: Provide two-hole, cast, copper alloy, ground plates suitable for installation in concrete. Fabricate the ground plates with two ½-inch diameter threaded holes and a 4/0 stud for connection to the grounding system.

B. Provide grounding plates with four (4) tapped NEMA size holes and spacing on the face, and a tapped hole on the underside for ease of positioning prior to pouring the concrete.

2.06 GROUND ROD ACCESS AND TEST WELL BOXES

A. Exterior Locations: Precast concrete or polymer concrete junction box with open bottom, UL listed, Tier 22 in accordance with ANSI/SCTE 77, with engraved/stamped cover reading "GROUND ELECTRODE".

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install a complete ground grid system installed as shown

1. Install conductors to preclude exposure to physical damage.

2. Install connections firm and tight.

3. Arrange conductors and connectors without placing strain on the connections.

4. Bury equipment grounding conductors as shown, or at a minimum of 12 inches below grade.

5. Bring loops or taps up for connection to equipment or other items to be grounded.

6. Install an insulated grounding conductor in all conduits.

7. When raceways are used to contain and protect grounding conductors, install in accordance with Section 26 05 33 and New York City Electrical Code.

8. Where conductors are installed in nonmetallic raceway, provide the grounding conductor in addition to the neutral wire, sized in accordance with New York City Electrical Code or as scheduled.

9. Perform exothermic welding with properly sized molds.

B. Grounding Rod Installation:

1. Install grounding rods as shown with the top of the rod a minimum of 12 inches below grade, and extend 10 feet vertically into the earth.

2. Drive grounding rods into permanently moist soil.

3. Provide additional ground rod sections as required to reach permanently moist soil.

4. Provide junction box without bottom for access to grounding rod and conductor where shown.

C. Equipment Grounding: Ground each piece of electrical equipment using a conductor in the raceway feeding the equipment in accordance with New York City Electrical Code, as shown on the Contract drawings.

1. Unless specified otherwise, connect transformer enclosures and neutrals to the grounding system. Connect the neutral ground connection at the transformer terminal. Make the connection from the ground grid to the ground bus and enclosures of mini power centers, lighting panelboards, and control relay panels.

2. Provide two separate, independent, diagonally opposite connections for power transformers so removal of one connection will not impair continuity of the ground system. Provide ground plates that are imbedded in the concrete pad so that transformers can be removed without damaging grounding system. Install a copper ground connect between ground plates and the transformers.

3. Provide ground connections to equipment using ground plates imbedded in the concrete pad so that the equipment can be removed without damaging grounding system. Provide a copper ground connection between ground plates and the equipment

D. Grounding Conductors: Connect the grounding conductor between the equipment and the grounding system. Where a ground bar is furnished with the panelboard, connect the grounding conductor to the bar

E. Install test points at locations as shown.

F. Ground receptacles and switches and their metal plates through positive ground connection to the yoke/strap, outlet box and grounding system grounding wire installed in the conduit.

G. Ground racks, supports, frames, covers and metal parts in manholes or handholes, controllers, motor frames, surge capacitors, arrestors, lighting fixtures, metal structures, exposed noncurrent carrying metal, mechanical equipment, hoist beams, cranes and similar items

H. Install an insulated cable for equipment with the phase conductors within the conduit for the nominal 120 volt and higher power, lighting and control circuits.

I. Connect ground grid system to existing grid system.

J. Connect the ground grid system to existing building steel columns.

3.02 FIELD TESTING

A. Tests: Conduct a witnessed test to determine the ground impedance for the entire system using a ground loop impedance tester. Provide a maximum impedance of 2 ohms at any point of the test. Add additional grounding rods if necessary to meet this requirement.

B. Provide testing consisting of the following:

1. Conduct resistance testing using a Biddle, Null Balance Earth Tester or Associated Research Vibro-ground, not less than 48 hours after rainfall. Should resistance values above 5 ohms, bring it to the Commissioner's attention.

2. Conduct continuity test on grounded cables and metal parts. Ground test the conduit system in accordance with the requirements of Section 26 05 33 - Raceway and Boxes for Electrical Systems.

C. Provide a Field Test Report, identifying the performed testing and the obtained results.

END OF SECTION 26 05 26

SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: Requirements for providing supporting devices. Provide supporting devices in accordance with the requirements specified under this section, the Contract Specifications and the Contract Drawings.

B. Provide supporting devices for complete system for the equipment. Provide all required support devices to properly mount and secure all equipment furnished under this Contract.

C. Provide electrical supporting devices that are designed, constructed and installed accounting for all gravity and resulting lateral forces, including seismic forces in accordance with the current seismic and earthquake regulations and provisions as contained in the International Building Code (IBC) 2003, Section 1621 and ASCE 7 -02, Section 9.6, in conjunction with the current New York City Building Code to the extent that the most stringent provisions are utilized in developing the design seismic forces. Refer to the Structural Notes on the Structural Drawings for site and structure specific seismic design criteria.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 33 - Raceway and Boxes for Electrical Systems

1.04 REFERENCES

A. Supporting devices shall comply with the latest applicable provisions and recommendations of the following:

1. ASTM A569 - Specification for Steel, Carbon, Hot-Rolled Sheet and Strip Commercial Quality.

2. ASTM A570 - Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

3. ASTM B633 - Specification for Electrodeposited Coatings of Zinc On Iron and Steel.

4. AISI - Standard for Stainless Steel.

5. MFMA-1 - Standard Publication for Metal Framing.

6. Electrical Code for the City of New York

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data and Information: Furnish catalog data for the supporting devices proposed for use with specifications and other data required to demonstrate compliance with the specified requirements.

C. Shop Drawings:

1. Scaled working drawings showing dimensions and locations of all items and clearance requirements.

2. Support details and equipment seismic anchorage and restraint details, stamped by a licensed Engineer as required. Engineer must be a Professional Engineer, licensed in the State of New York.

1.06 QUALITY ASSURANCE

A. Codes: Provide all materials and workmanship to meet the requirements of the Electrical Code for the City of New York and ANSI/NFPA 70 National Electrical Code.

B. Regulatory Requirements: Provide UL listed components.

C. Engineering Standard: Design all support devices as follows:

1. Provide all channels, fittings and hardware used in the supporting system in accordance with MFMA-1, Standard Publication.

2. Provide the design of the support system including proper sized rods, channels, fittings, brackets and appurtenances necessary to adequately support the equipment.

D. Seismic Requirements:

1. Provide seismic certified equipment for assemblies such as panelboards in accordance with the requirements specified in the applicable sections of the Contract Specifications.

2. Provide equipment anchorage details for all equipment certified to meet seismic requirements. Coordinate the details with the manufacturer's equipment mounting provisions.

3. Provide seismic restraints in accordance with electric conduits per the requirements of Specification 26 05 33 – Raceway and Boxes for Electrical Systems.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Allied Tube and Conduit
2. B-Line Systems
3. Kindorf
4. Enduro
5. Unistrut

2.02 CHANNELS, FITTINGS AND BRACKETS

A. Provide channels, fittings, brackets and related hardware for mounting and supporting the electrical equipment. Anchor bolts, concrete inserts and related hardware for proper support of equipment shall also be provided. Provide all equipment necessary to meet the seismic requirements specified shall be provided.

B. Provide channels conforming to ASTM A569 or A570 with a minimum thickness of 12-gauge. The cross sectional width dimension shall be 1-1/2 inch minimum. The depth shall be as required to satisfy load requirements.

C. Provide factory punched attachment holes, when required, on hole centers approximately equal to the cross sectional width and shall be 9/16 inch diameter.

D. Provide fittings and brackets having 9/16-inch diameter holes on centers identical to the channel or as required to align with the channel holes. Provide fittings and brackets having the same width as the channel and shall be 1/4 inch thick minimum. Provide fittings and brackets that mate properly with the channel.

E. Provide all channels, fittings, brackets and related hardware manufactured from steel and having an electro-plated zinc finish according to ASTM B633.

F. In corrosive areas, provide type 316 stainless steel channels, fittings, brackets and related hardware.

2.03 CONDUIT HANGERS, SUPPORTS AND INSERTS

A. Provide channels, rods, straps, anchors and related hardware for support of the exposed electric conduit system as specified in Section 26 05 33.

B. Provide anchor bolts, concrete inserts and related hardware for proper support of equipment. Provide all equipment necessary to meet the seismic requirements.

C. Provide tamper proof hardware for all outdoor exposed electrical systems and equipment.

D. Provide conduit hangers, supports and inserts in accordance with Section 26 05 33.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide all supporting devices installed level, parallel and perpendicular to building walls and floors, such that the support system is installed in a neat and professional manner.

B. Provide all holes in hung ceilings for support rods and other equipment made adjacent to bars where possible, to facilitate removal of ceiling panels.

C. Provide channels, fittings and brackets that are rigidly bolted together and braced to make a substantial supporting framework support system.

D. Where motor control centers, switchgear, unit substations and other electrical equipment are being installed on concrete pads, furnish leveling channels to the Structures and Equipment Contractor for installation in the concrete pads. Anchor seismic certified equipment in accordance with the seismic anchorage details.

E. Provide all equipment fastenings to steel columns, beams and trusses by beam clamps. In lieu of beam clamps, equipment may be welded to steel structures subject to Commissioner approval.

F. Do not drill holes in any steel columns, beams and trusses.

G. Provide hanger rod supports installed such that threaded rod is parallel and perpendicular to building walls and floors.

END OF SECTION 26 05 29

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: Requirements for providing electrical raceway systems as indicated, in accordance with the Contract Documents

B. Provide the conduit system required with all rigid and flexible conduits, boxes, fittings, supports, hangers and inserts and other conduit accessories as required for the installation of the electric wire and cable.

C. Install all PVC coated conduit to have the same uniform gray color. No other color variations will be accepted.

1.03 RELATED SPECIFICATIONS

A. Related work specified in other sections includes, but is not limited to, the following:

1. Section 26 05 00 – General Electrical Requirements
2. Section 26 05 43 – Underground Ducts and Raceway for Electrical Systems
3. Section 26 05 29 - Hangers and Supports for Electrical Systems

1.04 REFERENCES

A. Codes and standards referred to in this Section are:

1. ANSI C80.1 - Rigid Steel Conduit
2. ANSI C80.3 - Electrical Metallic Tubing,
3. ANSI C80.4 - Specification for Fittings for Rigid Metal Conduit and Electrical Metallic Tubing.
4. ANSI C80.5 - Specifications for Aluminum Rigid Conduit
5. ANSI C80.6 - Electrical Intermediate Metal Conduit
6. Electrical Building Code of the City of New York, New York City Building Code, International Building Code (IBC) 2003 Section 1621, and ASCE 7-02 Section 9.6.
7. UL 1 - Standard for Flexible Metal Conduit

8. UL 6 - Rigid Metal Electrical Conduit.

9. UL 50 - Electrical Cabinets and Boxes.

10. UL 360 - Liquid-Tight Flexible Steel Conduit.

11. UL 514A - Metallic Outlet Boxes.

12. UL 514B - Fittings for Conduit and Outlet Boxes.

13. UL 651 - Standard for Schedule 40 and 80 Rigid PVC Conduit

14. NEMA Standard No. RN-1, PVC Externally Coated Galvanized Rigid Steel Conduit.

15. Federal Specification WW-C-540C – Conduits, Metal, Rigid (Electrical, Aluminum)

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Working Drawings:

1. Submit a list of manufacturers with the products they produce proposed for the contract prior to equipment submission.

2. Provide manufacturer's catalog cuts for the conduit, boxes, fittings and supports proposed for use.

3. Provide construction details of conduit racks and other conduit support systems with seismic restraint details and calculations signed by a licensed Engineer. Engineer must be a Professional Engineer, licensed in the State of New York.

4. Provide Scaled working drawings showing proposed routing of all conduits, inclusive of conduits embedded in structural concrete and conduits directly buried in earth. Provide drawings showing locations of pull and junction boxes and all penetrations in walls and floor slabs.

5. Submit hangers and supports in accordance with Section 26 05 29 – Hangers and Supports for Electrical Systems.

C. Submit field test report.

1.06 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Rigid steel and intermediate metal conduits and electrical metallic tubing:
   a. Allied Tube and Conduit
   b. Wheatland Tube Company
   c. Republic Conduit

2. PVC coated steel conduits fitting and boxes:
   a. Plasti-Bond/Perma-Cote/KorKap-Robroy Industries
   b. Ocal – Thomas & Betts Corp.
   c. Perma-Cote Industries

3. Rigid nonmetallic conduits:
   a. Carlon Company – Thomas & Betts Corp.
   b. Cantex Inc.
   c. National Pipe Company

4. Aluminum Conduits:
   a. Allied Tube and Conduit
   b. Wheatland Tube Company
   c. Easco Aluminum

5. Liquidtight flexible steel conduit:
   a. Electri-Flex Company
   b. The International Metal Hose Co.
   c. Southwire
   d. Anamet Electrical, Inc.
   e. Thomas & Betts Corp.

6. Conduit Fitting and Connectors

a. Appleton Electric Company

b. Thomas & Betts

c. Crouse Hinds Company

d. OZ/Gedney Company

e. Hubbell - Killark

f. Adalet-PLM

7. Boxes and Enclosures:

a. Appleton Electric Company

b. Hubbell - Raco

c. Crouse Hinds Company

d. Thomas & Betts

e. Hoffman

f. Hope

g. OZ/Gedney Company

8. Strut Channel and Fittings

a. Allied Tube and Conduit

b. Cooper B-Line Systems, Inc.

c. Thomas & Betts –Kindorf/Superstrut

d. Enduro Systems

e. Strut Tech Systems

f. Unistrut

9. Cable Trays

a. Cooper B-Line

b. P.W. Industries

c. T. J. Cope

10. Fire Stop System

a. 3M/Electrical Products Division

b. Chartek International Protective Coatings

c. Nelson Fire Stop Products

11. Terminal Blocks

a. Phoenix Contact

b. ABB - Entrelec

c. Weidmuller

2.02 RIGID STEEL CONDUIT

A. General: Provide minimum 3/4-inch raceways in accordance with the requirements of UL-6.

B. Provide rigid steel conduit that comply with the requirements of ANSI C80.1, and the Underwriters' Laboratories, Incorporated, Standard for No. 6.

C. Protect both the inside and outside surfaces of the rigid steel conduit against corrosion by a coating of zinc applied by the hot-dip galvanizing process.

D. Provide rigid steel, heavy wall, hot-dip galvanized in accordance with the requirements of UL-6 and ANSI C80.1.

E. Provide intermediate metal hot-dip galvanized conduit in accordance with the requirements of UL1242 and ANSI C80.6.

F. Conduit, elbows and couplings shall include a PVC coating for all areas. For conduits located indoors in dry, dusty areas the use of rigid steel conduit without PVC coating shall be permitted. Reference the Contract Drawings for specific information regarding conduit type and usage.

G. Provide PVC coated rigid steel in accordance with the requirements for rigid steel raceway herein and with 40 mils bonded PVC exterior coating meeting requirements of UL-6 and NEMA RN1. Provide PVC coated rigid steel conduit that is listed and performance verified to ETL PVC-001 for 200 hours. Provide a nominal 2 mil urethane interior coating and a clear urethane coating over the galvanized threads

H. Provide rigid heavy wall aluminum alloy 6063T-1 conduit in accordance with the requirements of UL 6, Federal Specification WW-C-540C and ANSI C80.5.

I. Provide rigid nonmetallic Schedule 40 PVC in accordance with requirements of NEMA TC2 and UL 651 with solvent cement joints.

J. Provide rigid nonmetallic Schedule 80 PVC electrical conduit in accordance with the requirements of UL Standard 651 and NEMA Standard TC2 with solvent cement joints.

2.03 HANGERS, SUPPORTS AND INSERTS

A. Raceway Supports: Provide raceway supports meeting the following requirements:

1. Do not use perforated straps or plumbers tape for conduit supports.

2. Provide expansion bolts or inserts for fasteners in concrete, toggle bolts for hollow masonry or frame construction, and preset inserts for prestressed concrete.

3. Conduit Straps and Backs:

   a. For metallic conduits, provide steel or malleable iron.

   b. For nonmetallic and PVC coated conduits, provide PVC coated malleable iron with stainless steel anchors and bolts.

4. Conduit Hangers

   a. For metallic conduits, provide steel adjustable conduit hangers or clevis hangers.

   b. For nonmetallic and PVC coated conduits, provide PVC coated adjustable conduit hangers with stainless steel hardware.

5. Beam Clamps:

   a. For metallic conduits, provide malleable iron with steel bolt.

   b. For nonmetallic and PVC coated conduit, provide PVC coated malleable iron with stainless steel bolt.

6. Trapeze Hangers:

   a. For metallic conduits provide 12 gauge 1-1/2-inch square steel channels with steel channel straps to secure conduits.

   b. For nonmetallic or PVC coated conduit, provide either PVC coated 12 gauge 1-1/2-inch square steel channels or 1-5/8-inch square fiberglass channels. Provide PVC coated straps with stainless steel bolts for securing conduits.

   c. Provide addition channels welded together to limit the deflection to 1/240th of span.

7. Thread Rod

   a. Provide thread rod with the minimum size as follows:

      1) Conduit Hangers

         a) 3/4-inch to 1-1/2-inch conduit: 1/4-inch thread rod

         b) 2-inch to 3-1/2-inch conduit: 3/8-inch thread rod

         c) 4-inch and larger: 1/2-inch thread rod

2) Trapeze Hangers: Provide thread rod of sufficient size to support the load. Provide a minimum of 3/8-inch thread rod.

b. For Metallic Conduit Systems: Provide continuous threaded galvanized steel rod.

c. For Nonmetallic or PVC Coated Conduit Systems: Provide continuous threaded PVC coated galvanized steel rod.

B. Construct and install the electrical conduit system, including hangers, supports and inserts, accounting for all gravity and resulting lateral forces, including seismic forces in accordance with current seismic and earthquake regulations and provisions as contained in the International Building Code (IBC) 2003 Section 1621 and ASCE 7-02 Section 9.6, in conjunction with the current New York City Building Code to the extent that the most stringent provisions are utilized in developing the design seismic forces. Refer to the General Structural Notes on the Contract Drawings for the site and structure specific seismic design criteria.

C. Provide transverse and longitudinal bracing as required to brace the electric conduit for the seismic requirements specified.

D. For all drilled in type concrete inserts, use expansion shields or anchors conforming to Section 26 05 29 - Hangers and Supports for Electrical Systems. Use 316 stainless steel concrete inserts in corrosive locations.

2.04 FLEXIBLE METALLIC CONDUIT

A. Provide flexible metallic conduit where required to permit movement of connected devices and where it is impracticable to complete runs with rigid conduit.

B. Provide liquidtight flexible single strip steel, hot-dip galvanized conduit with PVC jacket in accordance with requirements of UL 1. Provide a continuous copper bonding conductor wound spirally between convolutions on the inside of the conduit meeting requirements of UL 360 for conduit sizes 1-1/4-inch and smaller.

C. Flexible metallic conduit and liquid-tight flexible metallic conduit length shall be five feet (5 ft.) maximum.

2.05 OUTLET BOXES AND FITTINGS

A. Provide approved type outlet boxes and fittings for rigid and flexible conduit required for the work which constitutes a part of the conduit system, shall be of approved types.

B. For outdoor, wet and corrosive areas, provide NEMA 4X outlet boxes with tamper proof screws. Provide conduit fittings and outlet bodies of cast gray iron alloy, cast malleable iron bodies and covers. Provide all units to be gasketed, watertight, and threaded with five full threads and shall have rust-proofing in accordance with the requirements of Article 2.06. Install fittings and bodies on PVC coated conduits shall also include interior and exterior coatings equivalent to the conduit.

C. Furnish watertight gaskets and blank covers for outlet boxes, furnished and installed for the installation of lighting fixtures, switches and receptacles in a future contract.

D. Provide approved fixture studs for all outlet boxes intended for fixtures.

E. For non-hazardous, indoor dry dusty areas, provide pressed steel boxes of the proper size and depths for the application. Boxes shall be rated NEMA 12, not less than No. 14 U.S. Standard Gauge (0.078 inch). The conduit openings shall be provided with oil-resistant gaskets. Conduits shall be fastened to these boxes with locknuts and bushings, and all unused outlets or holes shall be left sealed.

F. For concealed conduit runs in outside walls and all exposed conduit work, make the connections to boxes and fittings through threaded holes, unless otherwise approved by the Commissioner. For concealed conduit work in non-hazardous areas in other than outside walls, make connections between conduit and boxes with drilled holes, using locknuts and bushings.

G. Provide extension rings or plaster rings and covers for all boxes installed for concealed conduit, as required. For corrosive locations, use galvanized ferrous and galvanized cast ferrous metal cover and device plates with neoprene gaskets.

H. For outlet boxes and fittings installed on PVC coated conduit, provide interior and exterior coatings equivalent to the conduit.

I. Provide watertight gasketed covers held with nonferrous screws for all cast metal boxes.

2.06 CONDUIT ACCESSORIES

A. Provide conduit accessories for use with the conduit system.

B. Expansion and Deflection Fittings:

1. Expansion and deflection fittings shall be made up of non-corrodible parts and shall provide for ample longitudinal and lateral movement. A suitable bond shall provide a low resistance, continuous longitudinal path for ground currents.

2. Provide watertight cast iron, malleable iron or hot dipped galvanized expansion and deflection fittings. Provide corrosion-resistant, UL listed fittings compatible with the conduit system.

3. Provide a deflection and expansion coupling for rigid and intermediate metal conduits that have a ¾ inch movement in all directions from normal and a 30 degree angular deflection. Provide coupling that includes internal bonding jumper.

4. Provide a nonmetallic expansion coupling for nonmetallic conduits that have a 4-inch maximum expansion.

C. Sealing Fittings:

1. Provide cast gray iron alloy or cast malleable iron or copper free aluminum sealing fittings with zinc electroplate and lacquer or enamel finish.

2. Provide ample opening with threaded closure in sealing fittings for access to conduit hub for making dam. Provide suitable sealing fiber and compound for use with the fitting and shall be the products of the fitting manufacturer.

3. For corrosive locations, seal fittings shall include interior and exterior coatings equivalent to the PVC conduit coating specified under Article 2.02.

D. Drain Fittings:

1. Provide a combination device designed to provide ventilation to minimize condensation and drains accumulated condensate.

2. Provide the combination drain/breather fitting of 3/8 inch male thread size with stainless steel body.

E. Conduit Hubs:

1. Provide threaded, insulated throat type conduit hubs with bonding screw locknut.

2. Provide conduit hub and locknut of malleable iron or zinc and shall include a 90 degree C insulating surface and a sealing ring for watertight and dust tight connection.

F. Conduit Bushings:

1. Provide insulated nonmetallic bushing rated 105 degrees C for all installations where bonding is not required.

2. Provide insulated metallic grounding and bonding bushing rated 150 degrees C where bonding is required.

G. Duct Seal:

1. Provide a soft, fibrous non-hardening duct sealing compound for sealing between cables and conduits.

H. Conduit Tags:

1. Provide 19 gauge, 1-1/2-inch diameter round brass conduit tags which shall be secured to the conduit with annealed brass wire.

2. Clearly stamp conduit tags with the conduit number in conformity with the conduit and cable schedule or as directed by the Commissioner.

I. Conduit Markers:

1. Provide self-sticking color-coded conduit tape identification markers that are two inches wide and colored in accordance with the color banding specified under this section.

2.07 JUNCTION AND PULL BOXES

A. Provide cast aluminum boxes with mounting lugs, threaded hubs and gasket covers for surface mounted boxes

B. Provide fabricated sheet metal boxes when cast metal box weight exceeds 50 pounds. Construct box from 1/8-inch thick galvanized sheet steel or aluminum with sides return channel flanged around cover opening. Provide angle or channel supporting frame. Provide continuously welded and ground smooth seams. Provide mounting lugs and threaded conduit hubs.

C. Provide cast steel or fabricated 10-gauge Type 316 stainless steel for boxes either partially or fully encased in concrete. For partially encased boxes provide sides return channel flanged around cover opening. For fully encased boxes provide flush covers. Provide continuously welded and ground smooth seams. Provide mounting lugs and threaded conduit hubs

D. Provide boxes to conform to the following area classifications:

1. Provide all boxes located outdoors meeting NEMA 4 requirements. Construct boxes of galvanized cast iron and include gasketed, bolt on covers, with tapped holes in bosses or hubs for conduit entrance. Provide cast mounting lugs for installation in concrete with boxes.

2. For corrosive locations boxes shall be corrosion resistant, NEMA Type 4X. Construct boxes of 316 stainless steel material with sealed seams.

E. Provide watertight gasketed covers held with stainless-steel captive screw slot bolts.

F. For cast iron or cast ferrous alloy outlet boxes, junction boxes, pull boxes, conduit fittings and conduit accessories such as box covers provide rust-proofing by applying zinc coating by the "hot-dip" process or by a rust protective coating applied by either of the following methods:

1. Method A:

a. Provide castings with a mechanical and chemical cleaning.

b. Provide castings with a phosphoric acid type dip.

c. Apply a coating of zinc chromate primer, and finally

d. Apply a coating of baked enamel finish over the outside and inside surfaces of the castings.

2. Method B:

a. Provide castings with a mechanical and chemical cleaning.

b. Deposit a coating of cadmium electrolytically.

c. Then apply a coating of zinc by electroplating.

d. Then apply a vinyl resin base aluminum lacquer.

G. Provide stamped steel outlet boxes, junction boxes and box covers rust-proofing by applying a zinc coating via electro-galvanizing or sherardizing process. Form the fabricated sheet steel boxes from galvanized sheet steel. Touch up welded joints shall with aluminum lacquer and boxes and apply covers with a shop priming coat of zinc chromate rust inhibiting paint.

2.08 TERMINAL BOX

A. Provide minimum 12 gauge stainless steel fabricated box with mounting lugs, floor stand, and hinged doors.

B. Provide the door with continuous piano hinge and 3 point lockable latch. Provide print pocket on inside of door.

C. Provide back plate fabricated from 12 gauge minimum steel with white enamel finish for mounting terminals and wire troughs.

D. Provide wire troughs consisting of plastic ducts with snap slot design and removable covers. Run all wiring within wire troughs.

E. Furnish a schedule of terminals with the following information

1. Source

2. Type of Signal

3. Function

F. Provide removable jumpers to allow operation of the equipment.

G. Separate analog terminals from all other terminals.

H. Provide number of terminals shown. Where the number of terminals are not shown, provide sufficient terminals for each wire entering the terminal box plus 20 percent but not less than 10 spare terminals.

I. Use terminal blocks within terminal boxes for termination of prepared conductors No. 10 AWG and smaller. Provide terminal blocks in accordance with the following:

1. Provide high density, screw terminal type terminal blocks suitable for rail mounting with quantities sufficient for the conductors to be terminated plus 20 percent spare.

2. Provide NEMA rated, 600 volt, 35 ampere terminal blocks suitable for 85 degrees C.

3. Provide terminal block components having stainless steel and tin plated copper alloy components, backed out captive screws and marking surface.

2.09 CABLE TRAYS

A. Meet requirements of NEMA VE 1.

B. Type: Ladder, of welded construction.

C. Material: Copper-free aluminum alloy 6063-T3

D. Dimensions: As indicated on the drawings.

E. Cover: Solid, minimum 0.04-inch thick aluminum

F. Barrier Strip: Vertical, solid, with fittings and strip clamps.

G. Fittings to be of same cross-sectional dimensions as the tray and of hardware of same material as the tray.

H. Grounding: Conform to NFPA 70 and NEMA VE 1.

I. Design Loads: Use working load adequate for actual cable installed plus 20 percent allowance for future cables plus 200-pound concentrated static load applied midway between supports, with a safety factor of 1.5 in accordance with NEMA VE 1, Table 3-1.

J. Expansion Joints: NEMA VE 1 for 60 degrees F maximum temperature variation.

K. Furnish cable tray with smooth edges, free of burrs and weld projection.

1. Warning signs: 1-1/2-inch high black letters on yellow background with legend: "WARNING, NOT TO BE USED AS WALKWAY, LADDER OR SUPPORT FOR LADDERS OR PERSONNEL."

2.10 ELECTRICAL METALLIC TUBING

A. Electrical metallic tubing shall meet ANSI C80.3 and shall be UL listed. The conduit shall be furnished and installed in accordance with Article 348 of the New York City Electric Code. Electrical metallic tubing shall be manufactured by LTV Steel Tubular Products Company, "Electrunite", Triangular PWC, Inc., Allied Tube and Conduit Corporation, or equal.

B. The conduit shall be cold-rolled steel tubing with a zinc coating on the outside and protected on the inside by a zinc, enamel, or equivalent corrosion-resistant coating and conforming to the requirements of ANSI C 80.3, latest edition.

C. Fittings for electrical metallic tubing shall be rain-tight and concrete-tight, conform to UL 467 and UL 514, as applicable, and shall be plated steel hexagonal threaded compression type.

D. Electrical metallic tubing may be used indoors above reflected ceilings in classroom and office areas for lighting circuits, fire detection and alarm conduits, telephone, communications, and similar systems work.

PART 3 EXECUTION

3.01 GENERAL

A. General: Install electrical equipment and material of the size, type and general routing as shown or required.

B. Coordination with Reinforcing: Install raceway, fittings, boxes and cabinets free from direct contact with reinforcing steel.

C. Alignment: Provide fasteners, anchor bolts, anchorage items and supports as required to insure proper and rigid alignment. Attach equipment with fasteners sized according to size and weight of the equipment and the thickness of the supporting surface.

D. Grounding: Make metallic raceways electrically and mechanically continuous and ground as required. Install conduits continuous between outlets, boxes, cabinets and panels.

E. Conduit Material Types: Provide conduit as follows:

1. Provide aluminum conduit in all exposed indoor and outdoor installations, except as described below.

a. Provide rigid steel conduits in all installations concealed in structures, concrete encased within structures or under structures.

b. Provide rigid nonmetallic Schedule 80 conduits underground, concrete encased or direct buried, unless specifically detailed otherwise.

c. Corrosive Locations

1) Corrosive locations are defined in Section 26 05 00 or as shown.

2) Provide PVC coated rigid steel conduit in all installations in corrosive locations.

F. Should any structural difficulties prevent the setting of cabinets, boxes, conduits, etc., at points shown on the plans, allow and make any deviations as determined by the Commissioner and without additional cost.

G. Paint all exposed steel conduits, fittings, boxes, straps, racks and hangers. Do not paint PVC coated conduit systems. Paint shall match the gray color of the PVC coated conduits.

H. Install conduit tags where conduits terminate in equipment and enclosures.

I. Exposed conduits shall be color banded using conduit markers. Markers shall also include operating voltage when over 600 volts. Conduit markers shall be installed 360 degrees, double wrap around conduit exterior. Conduit markers shall be installed where conduits enter equipment, boxes, within each room, at wall penetrations and 50 feet on centers in each area. When exposed conduits are to be painted, markers shall be installed after the conduits are painted. Color banding shall be in accordance with the following:

1. 120/208 volt AC: Gray.

2. 277/480 volt or 480 volt AC: Sand.

3.02 INSTALLATION OF RACEWAYS

A. General: Unless otherwise indicated, install conduits exposed, parallel or perpendicular to building floors, ceilings and walls, to avoid interference with other work. Cut conduits square and deburr the cuts to the same degree as the conduit manufacturer. Fasten conduit securely to outlets, junction, pull and terminal boxes.

B. Provide caps and seals to prevent the entrance of foreign material and moisture during installation and before pulling wire.

C. Make changes in direction with bends or fittings. Use factory-made bends or elbows wherever possible. Make field bends and offsets with a hand bender or conduit-bending machine.

D. Space all parallel runs uniformly throughout and secure in place with hangers and fasteners. Brace raceways to satisfy the specified seismic requirements in accordance with the restraint details.

E. Keep conduit at least six inches away from high temperature piping, ducts, flues and surfaces. For mounting on concrete and masonry surfaces provide a minimum of 1/4 inch air space between conduit and mounting surface. Support and fasten conduit to building structural members spaced in accordance with electrical codes. Support conduit in accordance with New York City Electrical Code requirements.

F. When two or more exposed conduits are in the same general routing, provide parallel installation with symmetrical bends and for three or more provide trapeze hangers. Size trapeze hangers with space for 25 percent additional conduits. Provide hanger rods for trapeze hangers no less than 5/8 inch diameter.

G. Block and brace conduits embedded in concrete in place by use of adequate conduit separators to prevent displacement during the pouring of concrete.

H. Run conduit between outlet and outlet, between fitting and fitting or between outlet and fitting, with no more than the equivalent of three 90 degree bends between pull points. Provide no more than 125 feet of conduit runs between pull points. Provide pull boxes where shown, specified or wherever required to install conductors and to meet the above requirement.

I. Pitch conduits to outlet boxes to avoid trapping moisture. Where dips are unavoidable in exposed conduit runs, install drain fitting at low point.

J. Install thruwall type seals and conduit sealing bushings for all conduits passing through concrete slabs, floors, walls or block walls.

K. A 250 pound tested polyethylene pull tape shall be provided in all empty conduits, with a minimum 8 inch of slack, double backed into the conduit. Conduit shall be protected immediately after installation by installing flat non-corrosive metallic discs and steel

bushings designed for this purpose at each end. Discs shall not be removed until it is necessary to clean the conduit.

L. All conduit that is cut on the job shall be cut square and taper reamed to remove burrs before installation. Where steel conduit is cut and threaded on the site, it shall be coated before and after making connections.

M. Conduits embedded in concrete shall stub up 6 inches above the slab. A three inch high curb extending three inches from the outer surface of the conduit penetrating the floor shall be provided to prevent corrosion. Conduit stub-ups shall be terminated in couplings, slightly above the finished concrete curb.

N. Underground Conduits: Provide underground conduits meeting the requirements of Section 26 05 43.

3.03 CONDUIT CONNECTIONS TO EQUIPMENT

A. Install a complete conduit connection between the conduit system and the conduit connection point of the equipment at each electrical control device or other electrically controlled or operated equipment.

B. Provide watertight hub fittings for all boxes, enclosures and cabinets located below grade or in wet, damp or corrosive areas.

C. Provide rigid conduit connection where equipment is fixed and not subject to adjustment, mechanical movement or vibration. Provide union fittings to permit removal of equipment without cutting or breaking conduit.

D. Provide liquidtight flexible conduit connection where equipment is subject to adjustment, mechanical movement or vibration.

E. Coat all threads in steel conduit runs with zinc dust in oil or other corrosion-preventive compound before making connections

3.04 INSTALLATION OF BOXES AND FITTINGS

A. For boxes mounted on steel, concrete and masonry surface, provide a minimum 1/4-inch non-metallic spacer to hold the box away from the surface.

B. Install boxes rigidly and securely to the structure. Provide independent supports where no walls or other structural surface exists.

C. Provide separate support for boxes and bolt units to buildings with expansion anchors, toggle bolts or appropriate screws. For lighting fixture outlet boxes, provide supports adequate to support the weight of the fixture to be mounted on the box.

D. Install expansion fittings on exposed conduit runs exceeding 200 feet. Install the fittings on each conduit run in accordance with manufacture's recommendations to provide the additional movement necessary.

E. Unless otherwise indicated, mount outlet boxes flush with the finished wall or ceiling with the long axis vertical. Provide mounting heights measured from the finished floor to centerline of the outlet box as shown.

F. Provide watertight connections in wet and corrosive locations and terminate at enclosures with an approved conduit hubs.

G. Terminate all conduit connections in dry and dusty locations at enclosures with bushings and lock nuts. At each termination, include one bushing and two lock nuts. Install one lock nut inside and one lock nut outside the enclosure. Bond all conduits to the safety ground.

H. At pull and junction boxes having any box dimension in excess of 18 inches, install jumper type grounding bushings on conduit ends and install jumper wires to bond all conduits and to bond conduits to boxes.

I. Bond all insulated grounding bushings together and to the structure of the enclosure by a continuous, copper bonding wire.

3.05 CABLE TRAYS

A. Install in accordance with Application Information Section of NEMA VE 1.

B. Provide accessories as necessary for a complete system.

C. Install such that joints are not made at support brackets.

D. Install horizontal section support brackets between support point and quarter point of tray span.

E. Provide ceiling trapeze for all horizontal cable tray.

F. Install support within 2 feet on each side of expansion joints and within 2 feet of fitting extremity

G. Install tray level, plumb, straight and true to line or grade within a tolerance of 1/8 inch to 10 feet and within a cumulative maximum of 1/2-inch

H. Install without exposed raw or saw-cut edges

I. Maintain 12-inch vertical separation between multi-tiered trays having a common support and at all crossover locations.

J. Provide bonding jumper at each expansion joint and adjustable connection.

3.06 CLEANING AND PAINTING

A. Carefully clean all conduits before and after installation and all inside surfaces shall be free from all imperfections likely to injure the cable. Clean conduits in accordance with the following:

1. After erection of complete conduit runs, snake conduits with a suitable swap to which shall be attached an approved tube cleaner equipped with an approved cylindrical mandrel of a diameter not less than 85 percent of the nominal diameter of the conduit.

2. Remove all conduits through which the mandrel will not pass and replace at no cost. After snaking, protect the ends of the dead-ended conduits with standard malleable iron caps to prevent the entrance of water or other foreign matter.

3. Protect conduit after cleaning with caps to prevent entrance of water, concrete, debris or other foreign substance.

B. Touch Ups: Touch up all PVC coatings on conduit, fittings and boxes where scratched, marred or otherwise compromised during handling and installation per the manufacturer's instructions.

3.07 FIELD TESTS

A. After installation, perform and certify field testing for the electric conduit system, in the presence of the Commissioner witness. Provide testing consisting of the following:

1. Pull each conduit through a cylindrical mandrel as specified under paragraph 3.02 K. Maintain a record of all conduits testing clear.

2. Ground test the conduit systems in the presence of the Commissioner, who will inspect all enclosures, pull and junction boxes for bonding to the safety green conductor pulled with the nominal 120 volt and higher power and control circuits, and for bonding of the conduit grounding bushing to this safety ground.

3. Verify the separation of above safety grounding system from the instrumentation signal grounding.

B. Provide a Field Test Report identifying the testing performed and the results obtained.

END OF SECTION 26 05 33

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SECTION 26 05 43
UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Requirements for providing underground raceway system consisting of concrete enclosed conduits, direct buried conduits, cables, and handholes. Provide reinforced concrete encasement for the duct system.

B. Perform all excavations and backfilling as required, unless specifically shown otherwise on the Contract Drawings.

C. Underground electrical conduits, duct banks, manholes and grounding systems are shown on the Civil sitework drawings for general location. Refer to the Electrical drawings for sizes and quantities of conduits in underground duct banks. Provide all underground electrical conduits, reinforcing steel, concrete, foundation piles, grounding systems, duct banks, handholes, and lighting pole foundations in accordance with the Civil site work miscellaneous details.

1.03 RELATED SPECIFICATIONS

A.	Specification Section 31 23 16	-	Excavation – Earth and Rock
B.	Specification Section 31 23 23	-	Backfilling
C.	Specification Section 32 13 13	-	Concrete Paving
D.	Specification Section 32 14 10	-	Stabilized Gravel Paving
E.	Specification Section 32 14 20	-	Stone Paving
F.	Specification Section 03 30 00	-	Cast in Place Concrete
G.	Specification Section 26 05 26	-	Grounding and Bonding for Electrical Systems
H.	Specification Section 26 05 33	-	Raceway and Boxes for Electrical Systems

1.04 REFERENCES

A. Underground ducts shall comply with the latest applicable provisions and recommendations of the following:

1. Electrical Code of the City of New York.
2. National Electrical Safety Code.
3. UL No. 651 - Schedule 40 and 80 PVC conduit.

4.	NEMA TC2	-	Electrical Plastic Tubing, Conduit and Fittings.
5.	UL No. 1684	-	Reinforced Thermosetting Resin conduit.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data and Information: Furnish manufacturer's data for conduits, manholes, handholes and all accessories.

C. Contractors' Shop Drawings: Furnish working drawings for underground electrical raceway system showing conduits, concrete encasement, manholes, handholes, electrical equipment pads and reinforcing. Indicate the designation, type, size, location, elevations and slopes of the system. Provide scaled profile drawings as needed to resolve conflicts among the various disciplines and existing infrastructure. Profile drawings are to be scaled 1"=20'-0" horizontal and 1"=5'-0" vertical.

D. Quality Control: Furnish a signed and sealed certification from a professional engineer registered in the State of New York stating that the design calculations and drawings for the precast concrete manholes and handholes were prepared by that professional engineer or under his direct supervision.

1.06 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

1.07 PROJECT CONDITIONS

A. Existing Conditions: Examine record drawings to determine the location of all obstructions along the conduit or cable route and at the sites of manholes, handholes and outdoor electrical equipment pads. Contact the local underground utility locator service and confirm the location of all existing utilities prior to excavating for new work.

B. Field Measurements: Field survey, and in critical areas, excavate test pits to verify locations of probable obstacles along the conduit or cable route and at the sites of manholes, handholes and outdoor electrical equipment pads.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Conduit Spacers:
   a. Carlon Company
   b. Underground Devices, Inc.
   c. Formex Manufacturing

2. Precast Handholes:
   a. Penn-Cast Products, Inc.
   b. Hartford Concrete Products, Inc.
   c. Jensen Precast
   d. Oldcastle Precast
   e. Rockway Precast
3. Handhole Frames and Covers:
   a. Neenah Foundry Co.
4. Buried warning tape:
   a. Thomas & Betts
   b. W. H. Brady Company
   c. 3M
5. Manhole Accessories (pulling irons, cable rack and supports, insulators):
   a. Cooper Power Systems Division
   b. A.B. Chance Company
   c. Underground Devices Incorporated

2.02 MATERIALS

A. Conduit: Provide steel conduits for all systems throughout the concrete encased conduit system meeting the requirements of Section 26 05 33.

B. Cable: Provide cables meeting the requirements of Section 26 05 19.

C. Spacers: Provide rigid plastic, interlocking type conduit spacers to maintain conduit separation as indicated.

D. Underground Warning Tape: Provide 3-inch wide, four mil polyethylene or polyvinyl chloride tape type plastic tape in red (electric), yellow (utility) and orange (communications) colors with suitable warning describing the type of buried electrical lines. Provide warning tape by Seton, Ideal Industries or approved equal.

E. Duct seal for conduits shall be in accordance with the requirements of Specification Section 26 05 33 - Raceway and Boxes for Electrical Systems.

F. Concrete: Provide concrete meeting the requirements of Section 03 30 00. Dye "red" the top layer of concrete used for duct bank encasements.

G. Grounding: Provide grounding meeting the requirements of Section 26 05 26.

H. Precast Handholes: Provide precast handholes meeting the following criteria:
   1. Submit shop drawings showing reinforcing in accordance with ACI-SP-66.
   2. Submit detailed plans and sections showing all specified features and components.
   3. Provide submittals which bear the seal of the registered professional structural engineer who oversaw the design of the handholes. Engineer must be a Professional Engineer, licensed in the State of New York.

4. Submit units that comply with ASTM C478 and C478M.

5. Construct units using precast monolithic or assembled sections. Base and first riser will be monolithic.

6. Provide tongue and groove joints for interlocking adjoining components. Seal all joints watertight using preformed plastic or rubber materials conforming to ASTM C990 or GSA SS-S-210A.

7. Provide lifting devices cast into units.

8. Identify all structures with the manufacturers' name embedded or otherwise permanently attached to an interior wall surface.

9. Provide window openings in walls to accept duct banks as shown on the plans. Terminate and make watertight all duct bank terminations.

10. Provide a sump pit in the floor at one corner for drainage.

11. Provide a circular centered opening in the roof suitable for accepting precast collars with frame and cover specified. Provide water stops at framed cold joints.

12. Provide a floor sleeve at a corner of the manhole for the onsite driving of a ground rod. Seal to make watertight after installing ground rod.

13. Provide a 1/4 X 2 inch continuous copper ground bus installed 12 inches above the floor and mounted on suitable standoffs along the interior perimeter of the manhole for grounding of all metal parts within. Terminate all ground connections with exothermic welds. Where manholes consist of multiple compartments, provide a bonding conductor jumper between the ground buses in each adjacent compartment.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install underground, concrete encased and direct buried conduits as indicated.

B. Conduit Route: Establish and mark exactly conduit or cable routing. Resolve routing near existing obstacles and coordinate with other site work. Maintain a 12-inch minimum longitudinal clearance from the conduit bank encasement or direct buried conduit to adjacent utility lines. Maintain a 6-inch minimum vertical clearance from the conduit bank encasement or direct buried conduit to utility lines at crossovers. Adhere to lines, grades, elevations and dimensions as shown.

C. Install the duct system to avoid interferences with structures, piping and other underground systems. Size, arrange and install conduit duct banks in a reinforced concrete envelope as shown on the Contract Drawings.

D. Trench Excavation: Perform excavation work in accordance with the requirements of Section 31 23 16.

E. Spacers: Assemble duct banks using non-magnetic saddles, spacers and separators. Position the separators to provide 3-inch minimum concrete separation between the outer surfaces of

the ducts. Locate spacers at intervals of approximately four feet and stagger locations at each conduit tier to provide not less than 12-inches of longitudinal separation.

F. Conduit: Place conduit in straight lines and with a minimum slope of 0.25 percent (3 inches per 100 feet). Slope conduit down to manholes, handholes and structures. Install expansion fittings in straight runs exceeding 100-feet. Secure conduits in place to prevent floating and movement. Provide innerducts with pull strings installed in all conduits scheduled for the routing of instrumentation wiring (Cat 6, fiberoptic, twisted shielded, etc.) Provide spare innerducts to the maximum allowable capacity of the conduit size being used. Spare innerducts are to be of the same size used for the scheduled wiring.

G. Bends: Install 12-foot minimum radius bends in horizontal turns and vertical deflections. For bends used at ends of conduit runs install elbows with 4-foot minimum radius for 6-inch and 5-inch conduits, and elbows with 3-foot minimum radius for 4-inch and smaller conduits.

H. Provide watertight duct bank installations and penetrations through foundation walls.

I. Provide concrete covering on both sides, top and bottom of the concrete envelopes around conduits. Concrete covering shall be in accordance with the detail shown on the Contract Drawings. Top of concrete encasement shall not be less than thirty inches below finish grade. Add red dye to concrete used for envelopes or trowel a coloring on the concrete for easy identification during subsequent excavation.

J. Obtain written approval from the Commissioner before pouring concrete. Remove dirt, sand and debris around conduits and from workmat, prior to concrete placement.

K. Fix ducts firmly in place during pouring of concrete. Carefully spade and vibrate concrete to insure filling of all spaces between ducts.

L. Terminate all ducts entering hand holes using suitable end bells. Terminate rigid steel ducts using insulated grounding bushings.

M. Backfilling: Backfill meeting the requirements of Section 31 23 23. Provide a cover layer of sand that is 6 inches deep above direct buried conduits or cables

N. Install a ground cable in each duct bank envelope, in accordance with the requirements of Specification Section 26 05 26. Provide electrically continuous ground throughout the entire duct bank system. Connect ground cable to the building, station ground grid, equipment ground buses and to each conduit grounding bushing of the underground duct system. Terminate the ground cable at the last manhole or handhole for outlying structures.

O. Inside Cleaning: Pull a standard flexible mandrel not less than 12-inches long, having a diameter approximately 1/4-inch less than the inside diameter of the conduit, through each conduit, then pull a brush with stiff bristles through each conduit. Replace conduit runs that do not allow the passage of the mandrel with no increase in Contract Price. Use the pneumatic method to draw into conduit the nylon or polypropylene pull line. Plug and seal all conduits after cleaning. Include the duct bank conduit cleaning in the electric conduit system field test report specified in Specification Section 26 05 33.

P. Underground Warning Tape: Provide one underground warning tape for each trench up to 18 inches wide. For trenches wider than 18 inches provide two underground warning tapes installed at each edge of the trench. Place the tape or tapes 12 inches below the finished grade.

Q. Markers: Provide 4-inch round, 6-inch thick, concrete markers identified with the letter "E" and directional arrows. Place these markers approximately every 200 feet along straight portions of conduit and cable runs, at each change in direction and at the conduit run end. Install markers to protrude 1-inch above adjacent ground. Allow markers to protrude 1/2-inch in finished lawns. Do not place conduit markers at structures and at conduit risers.

R. Seal all ducts entering buildings and structures. Seal and plug all empty spare ducts.

S. An expansion and deflection fitting shall be installed on each conduit at each of the structural expansion joints when shown on the Contract Drawings. Joints shall be located as defined by the criteria noted on the Contract Drawings.

END OF SECTION 26 05 43

SECTION 26 22 00
LOW VOLTAGE TRANSFORMERS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: Requirements for furnishing and installing ventilated, dry-type transformers, including mini power centers consisting of a primary circuit breaker, dry-type transformer, a secondary panelboard with main breaker and branch circuit breakers.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 00 - General Electrical Requirements

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables

1.04 REFERENCES

A. Dry-type transformers shall comply with the latest applicable provisions and recommendations of the following:

1. Electrical Code of the City of New York.
2. ANSI C89.1 - Specialty Transformers.
3. ANSI C89.2 - Dry-Type Transformers for General Applications.
4. UL Standard No. 506 - Specialty Transformers.
5. UL Standard No. 1561 - Dry-Type General Purpose and Power Transformers.
6. NEMA ST 20 - Sound Levels.
7. NEMA TP 1 - Guide for Determining Energy Efficiency for Distribution Transformers.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Working Drawings:

1. Product Data and Information: Furnish manufacturer's data including:
   a. KVA ratings
   b. Service voltages
   c. Impedance and X/R ratio
   d. Number of phases

e. Taps
f. Insulation class
g. Sound level
h. Dimensions
i. Weights
j. Manufacturer's installation instructions
k. Mounting details
l. For mini power centers, furnish circuit breaker and panelboard ratings in addition to the above data

2. Submit dimensional drawings showing transformer details with diagrammatic nameplate.

3. Submit description of shop and field testing methods, procedures and apparatus with calibration dates shall. Submit testing methods and procedures at least 45 days in advance prior to conformation of witness testing dates and actual testing.

C. Quality Control: Furnish the following as specified in the DDC General Conditions.

1. Test Reports:

a. Certified production reports for sound-level and temperature in accordance with NEMA ST 20

D. Manufacturer's Installation Instructions

E. Operations and Maintenance Manuals: Furnish 6 copies of manufacturer's operations and maintenance manuals.

1.06 QUALITY ASSURANCE

A. General:

1. All transformers shall conform to the applicable NEMA, ANSI and IEEE Standards and shall be built by one approved manufacturer who shall use only best commercial materials and processes of manufacture. Transformer enclosures shall have ample room for primary and secondary wiring connections.

2. Provide UL listing and ANSI/NEMA sound level certifications.

3. The transformer manufacturer shall use a shop test facility that has recently calibrated testing apparatus and qualified, experienced technicians, for all shop tests. Calibration of testing apparatus shall be within one year.

4. All test equipment and instrument calibration shall be in accordance with the latest edition of the accuracy standard of the U.S. National Institute of Standards and Technology.

5. Provide "Energy Star" label for all transformers rated 15 kVA in accordance with NEMA TP 1.

B. Field testing of the transformers shall be performed in accordance with the requirements specified under Article 3.02.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all products and materials as specified in the DDC General Conditions and per manufacturer's recommendations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below.

1. Square D Company
2. Siemens
3. General Electric
4. Or approved equal

2.02 GENERAL PURPOSE TRANSFORMERS

A. Provide dry-type transformers suitable for outdoor installation in accordance with the locations shown on the Contract Drawings.

B. Provide transformers with KVA rating, primary voltage and connection, secondary voltage and connection and number of phases as shown on the Contract Drawings.

C. Insulation: Provide transformers above 15 kVA with 220-degree C temperature insulation materials. Provide transformers 15 kVA and below with a minimum of 185-degree C insulation materials. Provide mini power centers with 150-degree C insulation materials.

D. Transformer Taps: Provide transformers rated over 15 kVA with at least two 2-1/2 percent full capacity taps above and below nominal in the primary winding. Provide transformers rated 15 kVA and below with two five percent taps or with four 2-1/2 percent taps below rated voltage on the primary winding. Provide mini power centers with two five percent taps below rated voltage on the primary winding.

E. Provide the arrangement, assembly, and laminations of the core to facilitate repair to the windings. The design, shape, and arrangement of windings shall allow free flow of air for insulation and cooling.

F. Transformer coils shall be of the continuous wound copper construction and shall be impregnated with nonhygroscopic, thermosetting varnish.

G. Windings: Provide primary and secondary windings fabricated from copper conductors.

H. Constrict all cores from high grade, nonaging, grain-oriented silicon steel with high magnetic permeability and low hysteresis and eddy current loses. Magnetic flux densities are to be kept well below the saturation point. The core laminations shall be tightly clamped and compressed with structural steel angles. The completed core and coil shall then be bolted to the base by means of vibration-absorbing mounts to minimize sound transmission. There shall be no metal-to-metal contact between the core and coil assembly and the enclosure.

I. Provide enclosure made of heavy gauge steel and shall be degreased, cleaned, primed, and finished with baked weather-resistant enamel.

J. Provide wiring suitable for conduit entry and large enough to allow convenient wiring compartment for all transformers. Provide enclosures with maximum temperature that does not exceed 90 degrees Celsius. Furnish transformers with lugs of the size and quantity required and suitable for termination of the field wiring.

K. Visibly ground the core of the transformer to the enclosure by means of a flexible grounding conductor sized in accordance with applicable NEMA, IEEE, and ANSI standards.

L. K-Factor: Provide three-phase transformers with a K-Factor not less than 13.

M. Sound Levels: Do not provide transformers that exceed the following sound levels:

Transformer kVA	Average Sound Level in dB NEMA ST 20
0 – 09	40
10 - 50	45
51 – 150	50

N. The exteriors of the transformer enclosures shall be painted as follows:

1. Factory painting: Surfaces shall be cleaned carefully and given a priming basic lead chromate. This shall be followed by two coats of an approved paint applied by brushing.

2. Field painting: After delivery and installation, but before transformers are placed in service, all factory-painted surfaces shall be carefully cleaned and all abrasions shall be repaired. All painted surfaces shall then be given one brushed-on coat of paint as specified for the fourth coat of machinery and equipment. Color shall be ANSI #61. Provide cans of spray paint for field touch-up painting.

2.03 MINI POWER CENTERS

A. Main Circuit Breaker: Provide a main primary breaker with an interrupting rating of 14,000 rms symmetrical amperes at 277/480 volts.

B. Secondary Panelboard: Provide a three-phase, four-wire or a single-phase, three-wire secondary panelboard with plug-in circuit breakers. Provide 20-ampere, single-pole, 120-volt circuit breakers, unless otherwise shown. Provide all breakers with quick-make, quick-break, toggle mechanisms with automatic thermal-magnetic, inverse time-limit overload and instantaneous short-circuit protection on all poles, unless otherwise indicated. Indicate automatic tripping by the breaker handle assuming a clearly distinctive position from the manual ON and OFF position. Provide breaker handles that are trip-free on overloads. Provide circuit breakers having an interrupting rating of 10,000 rms symmetrical amperes at 240 volts.

C. Enclosure: Provide a totally enclosed, nonventilated, NEMA 3R enclosure with lifting eyes, fabricated from heavy-gauge steel. Provide an enclosure that limits the maximum temperature within the enclosure to 90 degrees C.

2.04 SHOP TESTS

A. Shop tests shall be performed at the transformer's manufacturer's plant prior to shipment. Shop tests shall demonstrate that the equipment tested conforms to the requirements specified.

B. Each transformer shall be given a routine test in accordance with the latest requirements of UL, ANSI and NEMA standards.

C. The Contractor shall provide a shop test report. The report shall identify the tests performed and the results obtained.

D. Transformer shop tests shall be performed consisting of the following:

1. Applied potential shall be performed.
2. Induced potential shall be performed.
3. No load losses shall be performed.
4. Voltage ratio shall be performed.
5. Polarity shall be performed.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install all transformers and provide guards as specified by the latest New York City Electrical Code and ANSI standards, and in accordance with manufacturer's instructions.

B. Clearances: Provide clearance around the transformer meeting the manufacturer's recommendation.

C. Supports: Provide suitable supports for all transformers. Mount transformers on one inch of Korfund, or equal sound-absorbent material.

D. Primary Disconnect: Provide primary disconnect circuit breaker or disconnect switch as shown or required.

E. Directory: For each mini power center, furnish a laminated, typewritten directory with the following information:

1. Circuit number
2. Area served
3. Utilizing equipment

3.02 FIELD TESTS

A. Perform insulation resistance tests on the transformers after installation. The tests shall be witnessed by the Commissioner and certified by the Contractor. The tests shall be performed by the Contractor who shall furnish all testing equipment.

B. Provide a field test report that identifies the tests performed and the results obtained.

END OF SECTION 26 22 00

SECTION 26 24 16
PANELBOARDS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Provide panelboards in accordance with the requirements specified under this section and the Contract Drawings.

B. This section includes power and lighting panels.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 00 - General Electrical Requirements

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables

C. Section 26 05 26 - Grounding and Bonding for Electrical Systems

1.04 REFERENCES

A. Panelboards shall comply with the latest applicable provisions and recommendations of the following:

1. Electrical Code of the City of New York.
2. UL Standard No. 50- Enclosures for Electrical Equipment.
3. UL Standard No. 67- Panelboards.
4. UL Standard 486A - Wire Connectors and Soldering Lugs for Use With Copper Conductors
5. UL Standard No. 489 - Molded Case Circuit Breakers.
6. UL Standard No. 943 - Ground Fault Circuit Interrupters.
7. NEMA PB 1 - Panelboards.
8. NEMA AB1 - Molded Case Circuit Breakers.
9. Fed. Spec W-P-115 - Power Distribution Panel.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Working Drawings:

1. Provide the manufacturer's catalog data for the panelboards, circuit breakers and accessories.

2. Provide a listing of the panelboards with the number and size of circuit breakers identified.

3. Provide dimensional drawings showing panelboard enclosure details.

4. Provide panelboard anchorage details with design calculations signed by licensed Engineer. Engineer must be a Professional Engineer, licensed in the State of New York.

C. Certificates of Compliance: Provide seismic qualification certification from the manufacturer including mounting recommendations.

D. Reports: Submit shop test reports.

E. Operations and Maintenance: Provide operation and maintenance manuals for the panelboards as specified in the DDC General Conditions.

1.06 QUALITY ASSURANCE

A. General:

1. Fabricate and test the panelboards in accordance with applicable ANSI, IEEE, NEMA and UL standards.

2. Direct the panelboard manufacturer to use a shop test facility that has recently calibrated testing apparatus and qualified, experienced technicians, for all shop tests. Indicate calibration of testing apparatus of within one year.

3. All test equipment and instrument calibration must be in accordance with the latest edition of the accuracy standard of the U.S. National Institute of Standards and Technology.

B. Construct and install panelboards suitable for earthquake regulations in accordance with the seismic requirements of the City of New York Building Code and the Uniform Building Code for zone 2A application.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Panelboards

a. General Electric Company
b. Square D Company
c. Eaton/Cutler-Hammer
d. Siemens

2.02 PANELBOARDS

A. General:

1. Provide factory-assembled fully rated dead-front type, panelboards, suitable for surface or flush mounting with branch circuit breakers and a main circuit breaker or main lugs as indicated.

2. Mount cabinets as shown on the Contract Drawings.

3. Provide transient voltage surge suppression integral with each panelboard.

4. Provide power and distribution panelboards equivalent to Cutler-Hammer Type Pow-R-Line 4B, General Electric type Spectra Series or approved equal.

5. Surge Protection Devices (SPD): Provide each panelboard with a surge protection device.

B. Ratings:

1. Provide panelboards with the voltage, frequency and current ratings as indicated conforming to NEMA Standard PB 1, Fed. Spec. W-P-115, UL 67 and the New York City Electrical Code.

2. Provide panelboards to be fully rated and with UL short circuit rating label.

C. Bus Bars:

1. Provide panelboards with copper main, neutral and ground buses.

2. Provide copper bus bars sized in accordance with UL standards to limit temperature rise on any current carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.

3. Provide bonded ground bus in all panels.

4. Provide main bus bracing exceeding the lowest interrupting rating of any circuit breaker installed.

5. Provide full-size neutral bars shall be provided for panelboards.

6. Where specifically shown on the Contract Drawings or stated in the Detailed Specifications, provide 200 percent rated neutral bus suitable for use with non linear loads. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection.

D. Cabinets:

1. Fabricate panelboards using 12 gauge galvanized steel, continuously welded. Provide cabinet fronts with doors over the circuit breakers. Provide doors fastened with concealed hinges and equipped with flush type catches.

2. Provide panelboards at least 20 inches wide, 5-3/4 inches deep, with wiring gutters on both sides

3. Provide all panelboard trims exceeding five square feet in area with an inside permanently secured angle to support the trim during fastening.

4. Provide NEMA 4X cabinets suitable for outdoor areas.

5. Provide identifying nameplates on panelboards in accordance with the requirements of Specification Section 26 05 00.

E. Circuit Breakers: Provide bolt-on type branch and main circuit breakers.

1. Furnish the frame sizes, trip settings and number of poles as indicated. Clearly identify the ampere trip rating on the circuit breakers.

   a. For lighting panelboards, provide 20-ampere, single-pole, 120 or 277 volt circuit breakers unless otherwise shown or scheduled.

   b. For distribution panelboards, provide 20-ampere, three-pole, 600-volt circuit breaker, unless otherwise shown or scheduled.

2. Provide molded case type circuit breakers conforming to NEMA Standard AB-1.

3. Provide all breakers with quick-make, quick-break, toggle mechanisms with automatic thermal-magnetic, inverse time-limit overload and instantaneous short circuit protection on all poles, unless otherwise indicated. Indicate automatic tripping by the breaker handle assuming a clearly distinctive position from the manual ON and OFF position. Design the breaker handle to be trip-free on overloads.

4. Provide breakers with 100 amp frames and 20 amp fixed thermal magnetic trip units as minimum, unless otherwise shown on the Contract Drawings. Provide interchangeable thermal magnetic trip units for frame sizes above 100 amps.

5. Interrupting Rating: 10,000 rms symmetrical amperes for circuit breakers on 240 volt systems or less, and 65,000 rms symmetrical amperes for circuit breakers on 277 or 480 volt systems.

6. Provide multipole breakers that utilize a common tripping bar.

7. Provide ground fault interrupter circuit breakers for all circuits serving receptacles located below grade and outdoors and as scheduled.

8. Provide full module size single-pole breakers. Do not install two-pole breakers in a single-pole module.

9. For lighting circuit switching, provide breakers suitable for the purpose and marked "SWD". For breakers requiring continuous operation, provide with a lock-on device.

2.03 ACCESSORIES

A. Directories: Provide a laminated typewritten directory to include circuit number, area served, and utilizing equipment. Provide directories in accordance with Section 26 05 00.

1. Provide typed panel directories (not handwritten), to include designations of each branch circuit. Cover the directory with a glass or noncombustible plastic cover.

2. Where execution of the work under this Contract requires certain circuits to be modified, update the panelboard directories to reflect modifications for certain circuits. Provide final typed directories at the end of the Contract

3. Provide both the equipment name and the tag identification number in panelboard directories. Where this will not physically fit in the standard panelboard directory, provide an additional expanded directory mounted behind the standard directory containing the above information.

B. Circuit Breaker Handle Lock: Where shown, provide circuit breakers with handle clamp that holds the circuit breaker handle in the ON position.

C. Keying: Key all panelboards alike with Yale lock and key, or approved equal.

2.04 CLEANING AND PAINTING

A. Shop Painting:

1. Thoroughly clean all metal surfaces of the panelboard enclosures and apply one coat of zinc chromate primer. Then apply interior surfaces with one shop finishing coat of a nitro-cellulose enamel lacquer.

2. Apply all exterior surfaces with three coats of the same lacquer. The color of finishing coats shall be light gray ANSI No. 61.

B. Field Painting: Touch up scratched and marred surfaces to match the original finish.

2.05 SHOP TESTS

A. Perform shop tests at the panelboard's manufacturer's plant prior to shipment. Demonstrate that the equipment tested conforms to the requirements specified.

B. Perform a 60 Hertz, AC, Hi-Pot test, phase to phase and phase to ground, at twice rated voltage plus 1000 volts for one minute, 1500 volts minimum as part of the shop testing procedures.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install all panelboards in accordance with manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions and in compliance with the requirements of NEMA standards, New York City Electrical Code, and applicable ANSI Publications. Anchor panelboards to satisfy seismic requirements in accordance with the anchorage details.

B. Mounting Height: Mount all panelboards as shown, such that the height of the top operating handle does not exceed 6 feet 6 inches from the floor. Mount all panelboards parallel or perpendicular to walls, such that panelboards are installed in a neat and professional manner.

C. Coordination: Coordinate with other Work including cabling and wiring work to interface the installation of the panelboards. Perform wiring neatly within the panelboards. Run wires vertically in the wire gutter and then terminate horizontally at a breaker.

D. Torque Requirements: Tighten electrical connectors and terminals, including screws and bolts, in accordance with the equipment manufacturer's published torque tightening values for the equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals in accordance with UL 486A.

E. Install blanking devices within panelboard spaces so bus bars are not exposed.

F. Install panelboard nameplates for identification of equipment.

G. Circuit Breaker Handle Lock: Install circuit breaker handle clamp on each circuit breaker as shown.

END OF SECTION 26 24 16

SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract.

1.02 SUMMARY

A. Section Includes: Requirements for providing wiring devices and appurtenances as indicated, in accordance with the Contract Documents.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 00 - General Electrical Requirements

B. Section 26 05 33 - Electrical Raceway System

C. Section 26 05 26 - Grounding

1.04 REFERENCES

A. Codes and standards referred to in this Section are:

1. New York City Electrical Code
2. Fed Spec WC 596 - Electrical Power Connector, Plug, Receptacle and Cable Outlet
3. Fed Spec WS 896 - Toggle and Lock, Flush Mounted Switches
4. CSA C22.2-182.1 - Industrial-type, Special-Use Attachment Plugs, Receptacles and Connectors
5. UL 20 - General - Use Snap Switches
6. UL 498 - Attachment Plugs and Receptacles
7. UL 508 - Industrial Control Equipment
8. UL 894 - Switches for Use in Hazardous (Classified) Locations
9. UL943 - Ground Fault Circuit Interrupters

10. UL 1010 - Receptacle-Plug Combinations for Use in Hazardous (Classified) Locations

11. UL 1682 - Plugs, Receptacles, and Cable Connectors of the Pin and Sleeve Type

12. UL 1686 - Standard for Pin and Sleeve Configurations

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data and Information: Provide manufacturers' catalog data for each device type, plate and cover type.

1.06 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

1.07 SPARE PARTS

A. General: Furnish the following spare parts.

1. Provide five 20-ampere, 125-volt, 2-pole, 3-wire grounding type plugs, NEMA 5-20P nylon housing, Hubbell Cat. No. HBL5366C, or approved equal.

2. Packaging: Package spare parts in containers bearing labels clearly designating contents. Identify all spare parts with information needed for reordering. Deliver spare parts in original factory packages

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Standard of Quality and General Configuration: Use of manufacturer's name and model or catalog number is for the purpose of establishing the desired product performance.

B. Configuration And Rating: Provide NEMA specification grade wiring devices in the type, color, configuration and electrical rating for the service indicated.

C. Symbols: See the electrical symbol list shown for identification of all device types.

D. Acceptable Manufacturers: Acceptable manufacturers are listed below. Other approved or equal manufacturers of equivalent products may be submitted for review.

1. Hubbell -Kellems Division
2. Bryant
3. Pass & Seymour/Legrand
4. Cooper Wiring Devices
5. Leviton
6. Appleton Electric Company
7. Cooper Crouse-Hinds
8. Meltric
9. Lutron
10. Tork
11. Tay Mac Corporation
12. Thomas & Betts

2.02 CONVENIENCE RECEPTACLES

A. General: Provide specification grade convenience receptacles conforming to Fed. Spec. WC 596 UL listed, with nylon impact resistant face, one piece metal wrap around mounting strap with assured grounding clip, back and side wired binding screw type terminals, brass power contacts and a heavy duty heat stabilized thermoset plastic base. Provide brown devices in unfinished areas and ivory devices in finished areas unless otherwise specified.

B. TYPES:

DESCRIPTION	RATING	COLOR	HUBBELL CAT. NO.
Duplex-corrosion-resistant	NEMA 5-20R 20A, 125V, 2P, 3W	Yellow	HBL53CM62

2.03 FLOOR BOXES

A. Floor Boxes: Provide cast iron floor boxes with corrosion resistant finish and fully adjustable tops to permit both vertical and angular adjustment before and after concrete is placed.

B. Flush Covers: Provide brass flush floor box cover suitable for the devices shown. Furnish brass carpet flanges as required.

C. Above Floor Fittings: Provide low profile above floor fitting consisting of an aluminum housing and stainless steel plates suitable for the devices shown.

D. Types:

DESCRIPTION	HUBBELL CAT. NO.
Single gang rectangular floor box	B2436
Two gang rectangular floor boxes	B4233
Three gang rectangular floor boxes	B4333
Rectangular flush cover for duplex receptacle	S3825
Rectangular flush cover for single receptacle or above floor fitting	S2625
Above floor service fitting	SC3099
Duplex receptacle plate	SS309D
Single receptacle plate	SS309S
Ground fault receptacle plate	SS309DS
Blank plate	SS309B

2.04 BOXES

A. Outlet Boxes: Provide outlet boxes in accordance with the requirements specified in Section 26 05 33.

2.05 PLATES AND COVERS

A. General: Provide covers and plates for the various areas as follows:

1. Architectural Finished Areas: Provide Type 302/304 stainless steel plates and covers for devices.

2. Areas Below Grade, Corrosive and Wet Areas:
   a. For switches provide weatherproof, gasketed, covers with external operating handle.
   b. For receptacles provide a weatherproof, gasketed, clear, flame-retardant, jumbo, polycarbonate cover a minimum of 5.4-inches deep, suitable for use with a 10-3 cord that allows the cover to be closed even when the receptacle is in use.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install all wiring devices in accordance with manufacturer's recommendations and approved shop drawings as specified in the DDC General Conditions.

B. Toggle Switches: Install toggle switches applicable for the area environment for switching lighting or other branch circuit loads.

C. Receptacles: Install receptacles applicable for the area environment.

D. Grounding: Ground all devices in accordance with the requirements specified in Section 26 05 26.

END OF SECTION 26 27 26

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SECTION 26 50 00
LIGHTING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.02 SUMMARY

A. Section Includes: Requirements for providing lighting fixtures and devices. Provide lighting fixtures as specified and as shown.

B. Provide complete lighting system including all supports, plaster frames, trim rings, outlet boxes, light standards, concrete bases, ground rods, and all accessories and appurtenances required for complete functioning lighting systems, as shown and as specified.

C. Performance Requirements: Provide lighting systems that adhere to code and are in accordance with manufacturers' recommendations.

1.03 RELATED SPECIFICATIONS

A. Section 26 05 00 – General Electrical Requirements

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

C. Section 26 05 33 - Raceway and Boxes for Electrical Systems

D. Section 26 27 26 – Wiring Devices

1.04 REFERENCES

A. Lighting fixtures and devices shall comply with the latest applicable provisions and recommendations of the following:

1. Electrical Code of NYC.
2. UL Standard No. 844 — Electric Lighting Fixtures for Use in Hazardous Locations.
3. UL Standard No. 1010 — Electrical Receptacle - Plug Combinations for Use in Hazardous Locations.
4. UL Standard No. 1703 — Flat Plate Photovoltaic Modules and Panels
5. IEC 61215

6. American National Standard Institute, ANSI.
7. Certified Ballast Manufacturers, CBM.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Manufacturer's Data and Information:

1. Submit a list of proposed manufacturers with the products proposed for the contract prior to equipment submission.
2. Furnish catalog data for all equipment provided under this section including the total input wattage for each type of lighting fixture specified.
3. Furnish complete photometric data reports from an independent testing laboratory with shop drawings for each luminaire. Luminaires submitted without photometric data will not be reviewed.
4. Furnish lamp type and technical information.
5. Furnish ballast type and technical information.
6. Furnish scaled working drawings showing the locations of all fixtures and devices. Include the proposed routing of the branch circuits in the drawings.

C. Submittals for Photovoltaic System for Custom LED Starlight Fixtures shall include:

1. "Days of Storage" battery capacity calculation will be based on an assumption of no sun and will Battery cycle life using manufacturer's cycle life vs. average depth of discharge. Estimates must take into account effect of temperature on cycle life.
2. Worst case (winter) average PV panel amp-hour production to specific worst case amp-hour load ratio (Array-to-Load Ratio). Calculations of Array-to-Load shall be based on the lowest average irradiance data from an accredited source (e.g. NREL TMY2), with an additional derating factor of 0.8 to account for worst-case conditions. Calculation should also take into account other aspects that could affect PV panel output, including temperature, shading, snow or dust coverage and non-optimal orientation
3. Line drawing of lighting system(s)
4. Wiring diagram(s)
5. Calculation of Effective Projected Area (EPA) of the lighting system, along with reference to the AASHTO design wind speed for the area and the EPA rating of the pole.
6. Product specification sheets
7. List of customer references that have deployed similar system.
8. Installation Instructions

9. Manufactures Life Cycle Curve (V Depth of Discharge)

10. Shall include all exceptions taken to the specification.

D. Quality Control: Furnish the following:

1. Manufacturer's certificates for equipment performance.

2. Manufacturer's test reports.

3. Manufacturer's installation instructions.

4. Photovoltaic panels shall be IEC61215 or IEEE1262 listed and/or UL 1703 listed.

5. Battery shall be rated "non-spillable" by ICAO/IATA/DOT manufactured in an ISO 9001 qualified facility.

E. Reports:

1. Field test reports shall be submitted.

2. Manufacturer's site visit report shall be submitted.

F. Operation and Maintenance Manuals: Furnish two copies of the operation and maintenance manuals for lighting equipment as specified in the DDC General Conditions.

1.06 QUALITY ASSURANCE

A. General:

1. Provide UL and FMS listed and labeled lighting equipment and approved for use in the City of New York. Refer to the lighting fixture types noted within the fixture schedule. The descriptions and catalog numbers serve to establish the quality, appearance and performance of the specified lighting fixtures.

2. Codes: Provide materials and workmanship that meet the requirements of the NFPA Standards and the New York City Electrical Code.

3. Furnish all lighting fixtures of lighting equipment manufacturers who have previously demonstrated, by performance and reputation, the ability to manufacture products of the quality specified. Such manufacturers must maintain an organization and manufacturing facility capable of actually manufacturing the specified lighting fixtures. For inspection, provide the Commissioner with free and easy access to manufacturing facilities and inventories of equipment by any proposed manufacturer.

4. Review all drawings and coordinate with all trades for the installation of lighting fixtures and devices.

5. Provide all industrial fixtures of the highest quality material and construction for their respective types.

6. Provide lamps for all lighting fixtures in accordance with the Federal Energy Legislation for reduced energy consumption.

7. When not definitely shown or specified, provide fittings and other materials for special fixtures of approved material, make and quality and shall have a finish that will harmonize with other parts of the fixtures. Where suitable standard materials are not available such parts of the fixtures shall be specially manufactured.

B. Installer Qualifications: The contractor or subcontractor performing photovoltaic system installation must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

C. Field Testing: The lighting fixtures shall be field tested. The field testing shall be performed in accordance with the requirements specified under Article 3.04.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions and as follows:

B. Storage and Protection: Store and protect equipment, components and accessories in accordance with the manufacturer's instructions and in accordance with the requirements of the DDC General Conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. General: The lighting fixture descriptions, manufacturers and catalog numbers listed in the Lighting Fixture Schedule are used to indicate the acceptable quality, design and distribution characteristics of approved lighting fixtures. Provide lighting fixtures complete with all required lamps, ballasts, fittings, receptacles, gaskets, globes and diffusers, as shown and scheduled.

B. Acceptable Manufacturers: Acceptable manufacturers are listed below.

1. EUPL3:
   a. Bega
   b. Amerlux
   c. Lumiere
   d. Or Approved Equal
2. WFL2B
   a. Kim Lighting
   b. Cooper Lighting
   c. Atlas Lighting
   d. Or Approved Equal
3. WFL3A / WFL3B

a. Crenshaw
b. Formed LED
c. Aurora Lamp Works Inc.
d. Or Approved Equal

4. STE02 / STE03
   a. LaMar LED
   b. Formed LED
   c. Aurora Lamp Works Inc.
   d. Or Approved Equal

5. Star Light
   a. LaMar LED
   b. Formed LED
   c. Aurora Lamp Works Inc.
   d. Or Approved Equal

6. Solar Battery Pole
   a. Solarone
   b. Solar Illuminations
   c. Topsolar Lighting
   d. Or Approved Equal

7. Utility Shed Light
   a. Lithonia
   b. Cooper Lighting
   c. Hubbell Lighting
   d. Or Approved Equal

2.02 LIGHT FIXTURES

A. Provide a lighting fixture for each fixture symbol shown on the Contract Drawings. Provide light fixtures in accordance with the lighting fixture schedule.

B. Provide all necessary hangers, supports, conduit adaptors, reducers, hooks, brackets and other support hardware. Provide all hardware with a protective, non-corrosive finish.

C. Globes: Provide gasketed, heat and impact-resistant, glass globes for incandescent, compact fluorescent, metal halide and sodium vapor fixtures.

D. Lamp Holders: Rigidly support screw-type, lamp holders, secure them against turning, and install them in a manner that allows for easy replacement. In general, fixtures designed to accept lamps of different wattages shall have adjustable sockets to allow for variations in lamp light centers. Provide brass, shell-type lamp holders. Aluminum shells will not be accepted.

E. Insulation: Provide a wire insulation systems and components that are capable of withstanding the temperatures to which they will be subjected in the fixture, while maintaining normal expected ballast life.

F. Where fixtures are subjected to moisture, or assembled of dissimilar metals, provide gaskets of approved material and thickness.

G. Wire fixtures completely except where they will be directly connected to branch circuit wiring. Provide conductor size no less than No. 12 gauge, stranded, with approved heat resistant covering.

H. Mount all fixtures shall be as shown on the Contract Drawings. For special types, the height shall be determined at the time of installation.

2.03 LAMPS

A. Provide lamps with voltage ratings suitable for the voltages as shown.

B. Provide standard-line phosphor coated metal halide lamps with wattage as indicated in the fixture schedule.

2.04 BALLASTS

A. General:

1. Provide ballasts matched for proper operation of lamps and meeting the requirements for fixture light output, reliable starting and operation.

2. Provide ballasts that are UL listed and certified by Electrical Testing Laboratories and conform to certified ballast manufacturer's specifications.

B. Fluorescent Ballasts:

1. Provide Class P ballasts for fluorescent fixtures bearing CBM and UL labels having a high power factor. Provide non-PCB capacitors. Provide ballasts with the quietest sound rating available for its type. In general, use A-sound rated, rapid-start, energy saving ballasts suitable for the lamps specified. Provide two-lamp ballasts whenever possible, unless specifically noted otherwise.

2. Provide controllable electronic ballasts that continuously dim between 20 and 100 percent of light output. Provide UL Class 2 dimming circuitry that is fully isolated and can provide a 0-10 VDC control signal between ballast and control element.

C. High Intensity Discharge Ballasts:

1. Provide ballasts for metal halide that are integrally mounted and suitable for operating the high intensity discharge lamp of the type and wattage rating scheduled. Provide non-PCB capacitors. Provide ballasts with sufficient open circuit voltage to strike and operate the lamp at temperatures down to 0 degrees F indoors and minus 20 degrees F

outdoors. Provide a ballast system that will not fail when a burned-out lamp is left in place for 120 days or less

2. Provide metal halide ballasts of the high power factor, peak-lead, autotransformer type with a minimum power factor of 90 percent for 70 watt lamps and above.

3. Provide (lag-type) magnetic regulator type ballasts for lamps 70 to 400 watts. Provide high power factor reactor ballasts for lamps below 70 watts.

4. Provides ballasts including the starter aid that protect itself against normal lamp failure modes and capable of operation with the lamp in an open or short circuit condition for six months without accelerated loss of ballast life.

5. Provide ballast with primary current that does not exceed normal operating current.

6. Provide ballasts capable of sustaining lamp operation with a line voltage dip or sag of 50 percent for up to 4 seconds when operating a nominal voltage lamp, with nominal line voltage applied to the ballast primary, as defined in ANSI 82.6

7. Provide lamp/ballast system with line power factor that does not drop below 90 percent for plus or minus 10 percent line voltage variations at any lamp voltage, from nominal through rated end-of-life lamp voltage, as described in ANSI 82.6.

2.05 LED LIGHTING

A. LED Drivers: Provide LED drivers meeting the following requirements:

1. Minimum Efficiency: 85%.

2. Starting Temperature: - 40 degrees F.

3. Input Voltage: 120 volts.

4. Power Supplies: Class I or II output.

5. Power Factor: .90 or greater.

6. Total Harmonic Distortion: 20% or less.

7. Comply with FCC Title 47, CFR Part 18 Non-consumer RFI/EMI Standards.

8. Drivers shall be reduction of hazardous substance (ROHS) compliant.

9. Surge Protection: Survive 250 repetitive strikes of "C Low" waveforms at 1 minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ANSI C62.41.2-2002, Scenario 1 Location Category C.

B. LED Sources: Provide LED sources meeting the following requirements:

1. Operating Temperature Range: - 40 degrees F and 120 degrees F.

2. Correlated Color Temperature: Refer to Lighting Fixture Schedule

3. Color Rendering Index: 65 and greater.

2.06 PHOTOVOLTAIC SYSTEM FOR CUSTOM LED STARLIGHT FIXTURES

A. General: Provide photovoltaic systems consisting of canopy mounted photovoltaic panels, batteries, control modules, LED drivers and all electronic and grounding components for a complete system meeting all of the performance criteria to provide power to custom LED in-ground indicator lights that are arranged in a custom fabricated fixture called Starlight, as shown on the Contract Drawings.

1. Provide one complete photovoltaic system at the utility shed to supply enough power to Custom LED Starlight fixtures 1 through 8 (total of 32W for LED lamps and driver at full power). Locate the photovoltaic panels and photocells on the roof, mount the battery and control module enclosure inside the utility shed.

2. Provide one complete photovoltaic system at bench with shade roof as shown on the plans to supply enough power to Starlight fixtures 9 through 12 (total of 10W for LED lamps and driver at full power). Locate the photovoltaic panels and photocells on the bench shade roof, mount the battery and control module enclosure on a nearby pole as shown on the plans.

B. System Requirements:

1. Operating Profile: Provide system capable of supplying Custom LED Starlight fixtures with 10 hours of peak level lighting. Peak hours may be allocated between evening and pre-dawn as desired by client.

2. Design Sun Hours: 2.18 with 0.4 shading factor.

3. Provide photovoltaic lighting system rated to operate in an ambient temperature range of -40 degrees F to 140 degrees F.

4. Provide all electronic components rated between -40 degrees F to 140 degrees F or better.

C. Photovoltaic Panels

1. Provide photovoltaic panels consisting of monocrystalline silicone solar cells in a module package made of low-iron tempered cover glass, UV stabilized encapsulant and tempered glass. Provide panels with actual module power ratings not lower than 5% of the nominal rating at Standard Test Conditions (STC) and other electrical characteristics within 10% of nominal ratings.

2. Provide 1 year workmanship warranty and 20 year power warranty.

3. Provide photovoltaic panel systems that meet IEC 61215, UL 1703 or equivalent standard.

D. Batteries

1. Provide leak-proof, sealed, maintenance free lead acid type of Absorbed Glass Mat construction batteries, 12 volts DC.
2. Provide batteries with manufacturer's cycle life curve at or above 2700 cycles at 20% depth of discharge (DOD).
3. Provide battery energy capacity that is no less than the minimum 7.3 days of storage after taking into account cold temperatures and low voltage disconnect.
4. Provide battery with discharge rate not exceeding the c/20 rate. Provide battery state of charge to have over 75% average over the course of a given year.
5. Provide protective insulation for battery terminals against inadvertent shorting.
6. Provide overcurrent device rated to protect wiring and cabling under continuous load and rated to interrupt current from battery bank.

E. Lighting Controller Modules

1. Provide lighting controller module capable of properly charging battery from photovoltaic panel, including bulk, absorb, and float stages.
2. Provide 15.5 Volt high voltage disconnect of PV panel from 12VDC nominal battery bank. Provide 31Volt disconnect for a 24 nominal VDC battery bank.
3. Provide means to step up or down battery voltage to lamp voltage.
4. Provide low voltage load disconnect that can be set either to 11.5 volts or 10.5 volts for 12 nominal VDC battery bank or 23 volts or 21 volts for 24 nominal VDC battery bank.
5. Provide lighting controller module with ability to program peak lighting level for a period of time after dusk and before dawn, as well as the ability to set an off-peak lighting level in between the post-dusk and pre-dawn peak period. This should not be done with a time-of-day clock that must be reset for changes in daylight savings time.
6. Provide controller module with ability to adjust the solar module output power in order to optimize charge to suit the battery's needs.
7. Provide ability to optimize charge to battery based on its temperature.
8. Provide protective fusing and/or circuit breakers to withstand a reverse polarity connection to battery and/or photovoltaic panel. Provide system with means to disconnect all circuits (photovoltaic, battery and load).

F. Enclosures

1. Provide NEMA3R or better, powder coated aluminum construction with lockable hasp or vandal proof hardware.

G. Photocells

1. Provide SPST photocells suitable for 12 volt operation for use with lighting controller module. Provide photocells with a 1/2-inch conduit fitting and a die-cast zinc housing suitable of operating from -40 degrees F to 140 degrees F.

H. Hardware and Accessories

1. Mounting: Furnish "Z" brackets to be used to mount panels to utility shed or bench roof,

2. Orient and tilt photovoltaic panels for maximum energy production during the longest night/shortest day. Furnish all other metal parts to be aluminum or stainless steel, consistent with 20 year life.

3. Grounding: Provide options and accessories for grounding in accordance with Section 26 05 26.

2.07 PHOTOCELLS

A. General: Provide SPST photocells suitable for 120-volt operation and capable of switching 1800 VA. Provide photocells that turn on at light levels of 1.5 to 5.5 footcandles and turn off at approximately three times the turn-on value. Incorporate a built-in, approximately 2 minute time delay to avoid false switching due to lights from vehicles or lightning. Provide photocells with a 1/2-inch conduit fitting and a die-cast zinc housing suitable of operating from -40 degrees F to 140 degrees F.

2.08 LIGHTING CONTACTOR PANELS

A. Provide lighting contactor panels shall be provided for the control of lighting fixtures as shown. Arrange the panel control and devices for proper operation in accordance with the control schematics as shown.

B. Enclosures: Provide enclosures designed for surface mounting, as specified.

C. Contactors: Provide contactors, as specified with voltage, ampere, number of poles and quantities within each panel as shown on the Contract Drawings. Provide contactors with vibration mounts, and be mechanically held type suitable for 120 volt operation and switching ballast type lighting.

D. Relays and Control Devices: Provide relays, switches, indicating lights as specified.

2.09 RECEPTACLES

A. General:

1. Provide receptacles in accordance as shown on the Contract Drawings, complete and include all accessories for proper installation.

2. Provide outlet boxes for receptacles in accordance with Section 26 05 33 – Raceways and Boxes for Electrical Systems.

B. Receptacles:

1. Provide receptacles in light standards where shown.

2. For wet and corrosive locations provide marine duty receptacles that are straight blade type, with heat resistance melamine body. Provide special receptacles in wet and corrosive locations to be of Type 316 stainless steel.

C. Plates and Covers:

1. For wet and corrosive locations, furnish neoprene gasketed covers of galvanized ferrous or cast ferrous metal. Equip covers with gasketed spring doors for receptacles.

PART 3 EXECUTION

3.01 PREPARATION

A. Packing: Suitably pack and rigidly brace all equipment and protect it against weather, damage and undue strain during shipment.

3.02 INSTALLATION

A. General: Install lighting fixtures and lamps in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions. Locate fixtures to suit the architectural details of the area involved. Coordinate placement with the details indicated on the architectural reflected ceiling drawings or architectural elevations. Install lamps of proper type, wattage and voltage rating in fixtures prior to completion of project. Install all fixtures to comply with applicable provisions of the New York City Electrical Code. Provide fluorescent fixtures "quick disconnects" when not factory installed

B. Install complete with all hardware, and supporting devices necessary to make a safe complete and fully operative installation. Provide straps, mounting plates, nipples, plaster rings, brackets and all accessories necessary for proper installation. Obtain diagrams, illustrations and other installation instructions from the manufacturer for each lighting fixture and install in strict conformance with such instructions and the requirements of NYC Electrical Code.

C. When lighting fixtures or hanger canopies are mounted flush to the ceiling or walls, and where raceways and outlet boxes serving the lighting fixtures are surface mounted to the ceiling or wall, provide finishing rings to conceal the outlet box. Provide all visible hanging devices and appurtenances with the same finish as the lighting fixture.

D. Do not install reflectors, lenses, diffusers, louvers and decorative elements of lighting fixtures until completion of plastering, ceiling tile work, painting, and general clean-up in the area.

E. Concrete Bases: Provide concrete bases for outdoor lighting standards including underground ducts and conduits and required grounding as shown and as specified. Install receptacles where shown as specified in Section 26 27 26. Provide steel reinforcing bars, anchor bolts, and bolt circle for concrete bases as shown and specified and provide leveling shims as required.

3.03 INSTALLATION OF DEVICES

A. General: Install lighting fixtures and lamps in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions. Locate fixtures to suit the architectural details of the area involved. Coordinate placement with the details indicated on the architectural drawings or architectural elevations. Install lamps of proper type, wattage and voltage rating in fixtures prior to completion of project. Install all fixtures to comply with applicable provisions of the New York City Electrical Code. Provide fluorescent fixtures "quick disconnects" when not factory installed.

B. Accessories: Provide straps, mounting plates, nipples, plaster rings, brackets and all accessories necessary for proper installation.

C. Lighting Contactor Panels:

1. Panels shall be mounted rigidly and securely to the building structure or to supporting devices which are rigidly and securely supported to the building structure.

2. Panels shall be fastened with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units and with machine screws or welded studs on metal.

3. All panels shall be mounted parallel or perpendicular to walls, such that panels are installed in a neat and professional manner.

D. Photocells: Install photocells in an upright position, 6-inches on top of the south wall of vessel-6 with the lens facing north.

E. Concrete Bases: Provide concrete bases for outdoor lighting standards including underground ducts and conduits and required grounding as shown and as specified. Install receptacles where shown as specified in Section 26 27 26. Provide steel reinforcing bars, anchor bolts, and bolt circle for concrete bases as shown and specified and provide leveling shims as required.

F. Photovoltaic Systems: Install photovoltaic systems in accordance with NEC Article 690 (Solar Photovoltaic Systems).

G. Receptacles:

1. Receptacles shall be installed within outlet boxes at locations indicated on the Contract Drawings and in accordance with code requirements.

2. Where devices are grouped they shall be mounted under a common plate. Where directed or where space conditions limit gang mounting, tandem or tandem gang arrangement shall be provided.

3.04 FIELD TESTS

A. After installation, test the entire lighting system for continuity and balance after installation and prior to acceptance. Perform and certify the field tests witnessed by the Commissioner. Provide testing consisting of the following:

1. Wiring continuity test

2. Branch circuit load balance test.
3. Fixture and control operation test.
4. Receptacle polarity and grounding.

B. Provide a field test report that identifies the tests performed and the results obtained.

3.05 MANUFACTURER'S FIELD SERVICES

A. Provide equipment start-up services and instruction. Provide the assistance of a qualified manufacturer's service representative in the installation of the lighting system, to check the installation before it is placed into operation, to assist in the performance of field tests, to observe the initial operation and to train the plant operations and maintenance staff in the care, operation and maintenance of the system.

B. Provide a field report from the manufacturer's representative for each visit to the site, including complete information on time, schedule, tasks performed, persons contacted, problems corrected, tests results, training instruction and all other pertinent information.

C. Have the service representative sign in with the Commissioner on each day they are at the site.

3.06 CLEANING AND PAINTING

A. Shop Painting: Shop paint equipment as noted on the Contract Drawings.

B. Steel Surfaces: Prior to final completion of the Work, thoroughly clean all steel surfaces and retouch all scratches and abrasions. Use the same paint as used for shop finishing coats.

C. Photometric Control Surfaces: Clean photometric control surfaces as recommended by the manufacturer.

D. Relamping: Relamp fixtures that have failed lamps at substantial completion.

END OF SECTION 26 50 00

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SECTION 26 56 00
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.02 SUMMARY

A. Section Includes: Requirements for providing outdoor lighting. Provide outdoor lighting luminaires and standards as listed in the Lighting Fixture Schedule.

B. Provide complete outdoor lighting system including all luminaires, poles, pole bases, reinforced concrete foundations and accessories as required for the installation of the outdoor lighting.

C. Perform all excavations, complete all forms, and do backfilling and tamping as required.

1.03 RELATED SPECIFICATIONS

A. Section 31 23 16 - Excavation – Earth and Rock

B. Section 31 23 23 - Backfilling

C. Section 26 05 00 - General Electrical Requirements

D. Section 26 50 00 - Lighting Fixtures and Devices

1.04 REFERENCES

A. Codes and standards referred to in this Section are:

1. Electrical Code of NYC.
2. UL Standard No. 1572 - High Intensity, Discharge Lighting Fixtures.

1.05 SUBMITTALS

A. General: All submittals shall conform to the requirements specified in the General Conditions.

B. Working Drawings:

1. Submit a list of proposed manufacturers with the products they produce proposed for the contract prior to equipment submission.

2. Furnish catalog data for all equipment provided under this section including the total input wattage for each type of lighting fixture specified

3. Furnish complete photometric data reports from an independent testing laboratory with shop drawings for each luminaire. Luminaires submitted without photometric data will not be reviewed.

4. Furnish pole and base construction details

5. Submit scaled working drawings showing the locations of all fixtures and shall include the proposed routing of supply conduits.

6. Furnish bills of materials.

C. For custom luminaires and custom lighting fixture supports, submit one manufacturer mock-up and two prototypes to the Commissioner for review and approval. Do not submit the first prototype until the mock-up has been submitted and approved. Do not fabricate the production fixtures until the second prototype has been submitted and approved. The production fixtures shall be identical to the second prototype except as modified by the Commissioner's comments on the second prototype. Submit all prototypes for approval to be working fixtures constructed of materials identical to those proposed for production including all supports, brackets and fasteners. Conduct a shop witness test for each first prototype. Install second prototypes in their final location and have them tested at night time. Power shall be supplied by the contractor.

D. Quality Control: Furnish the following

1. Manufacturers certificates for equipment performance

2. Manufacturers test reports.

3. Manufacturer's installation instructions and provisions for relamping lighting fixtures from the ground.

E. Operation and Maintenance Manuals: Furnish two copies of the operation and maintenance manuals for lighting equipment as specified in the DDC General Conditions.

1.06 QUALITY ASSURANCE

A. General:

1. Submit lighting fixtures UL listed and approved for use in NYC. The lighting fixture types are noted within the fixture schedule. The descriptions and catalog numbers serve to establish the quality, appearance and performance of the specified lighting fixtures.

2. Submit all lighting fixtures to be the products of lighting equipment manufacturers who have previously demonstrated, by performance and reputation, the ability to manufacture products of the quality specified. Such manufacturers must maintain an organization and manufacturing facility capable of actually manufacturing the specified lighting fixtures. For the

purpose of inspection, assure the Commissioner free and easy access to the manufacturing facilities and inventories of any proposed manufacturers equipment.

3. Use low carbon alloy steel with minimum yield strength of 50,000 p.s.i. or stainless steel bolts, nuts, washers and screws for exterior lighting systems.

4. Have the manufacturer for custom luminaires and lighting fixtures obtain and submit to the Commissioner a certification of approval from UL for every custom fixture prior to production.

B. Field Testing: Perform the field testing in accordance with the requirements specified under Article 3.02.

1.07 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

B. Regulatory Requirements: Provide UL and FMS listed and labeled lighting equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. General: The lighting fixture descriptions, manufacturers and catalog numbers listed in the Lighting Fixture Schedule as shown on the Contract Drawings are used to indicate the acceptable quality, design and distribution characteristics of approved lighting fixtures. Provide lighting fixtures complete with all required lamps, ballasts, fittings, receptacles, gaskets, globes and diffusers, as shown and scheduled.

B. Acceptable Manufacturers: Acceptable manufacturers are listed below.

1. EUPL3:
   a. Bega
   b. Amerlux
   c. Lumiere
   d. Or Approved Equal

2. WFL2B
   a. Kim Lighting
   b. Cooper Lighting
   c. Atlas Lighting
   d. Or Approved Equal

3. WFL3A / WFL3B
   a. Crenshaw Lighting

b. Formed LED
c. Aurora Lamp Works Inc.
d. Or Approved Equal

4. STE02 / STE03
   a. LaMar LED
   b. Formed LED
   c. Aurora Lamp Works Inc.
   d. Or Approved Equal

5. Star Light (Custom Manufactured Fixture)
   a. LaMar LED
   b. Formed LED
   c. Aurora Lamp Works Inc.
   d. Or Approved Equal

6. Solar Battery Pole
   a. Solarone
   b. Solar Illuminations
   c. Topsolar Lighting
   d. Or Approved Equal

7. Utility Shed Light
   a. Lithonia
   b. Cooper Lighting
   c. Hubbell Lighting
   d. Or Approved Equal

2.02 LUMINAIRES

A. Provide luminaires for each lighting fixture symbol shown on the Contract Drawings. Provide luminaires in accordance with the lighting fixture schedule.

B. Mount all outdoor fixtures per heights as shown on the Contract Drawings.

2.03 BALLASTS

A. Provide Class P ballasts for fluorescent fixtures bearing CBM and UL labels having a high power factor. Provide non-PCB capacitors. Provide ballasts with the quietest sound rating available for its type. In general, use A-sound rated, rapid-start, energy saving ballasts suitable for the lamps specified. Provide two-lamp ballasts whenever possible, unless specifically noted otherwise.

B. Provide ballasts for metal halide fixtures that are integrally mounted and suitable for operating the high intensity discharge lamp of the type and wattage rating scheduled. Provide non-PCB capacitors. Provide ballasts with sufficient open circuit voltage to strike and operate the lamp at temperatures down to 0 degrees F indoors and minus 20 degrees F outdoors. Provide a ballast system that will not fail when a burned-out lamp is left in place for 120 days or less.

C. Provide metal halide ballasts of the high power factor, peak-lead, autotransformer type with a minimum power factor of 90 percent.

2.04 LED DRIVERS

A. Provide LED drivers meeting the following requirements:

1. Minimum Efficiency: 85%.
2. Starting Temperature: - 40 degrees F.
3. Input Voltage: 120 – 480 volts.
4. Power Supplies: Class I or II output.
5. Power Factor: .90 or greater.
6. Total Harmonic Distortion: 20% or less.
7. Comply with FCC Title 47, CFR Part 18 Non-consumer RFI/EMI Standards.
8. Drivers shall be reduction of hazardous substance (ROHS) compliant.
9. Surge Protection: Survive 250 repetitive strikes of "C Low" waveforms at 1 minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ANSI C62.41.2-2002, Scenario 1 Location Category C.

2.05 LED SOURCES

A. Provide LED sources meeting the following requirements:

1. Operating Temperature Range: - 40 degrees F and 120 degrees F.
2. Correlated Color Temperature: (2700K)
3. Color Rendering Index: 65 and greater.

2.06 POLES AND BASES

A. Provide poles and bases in accordance with the structural design criteria in the Specifications with the Details shown on the Contract Drawings.

B. Provide outdoor lighting standards and luminaires that can withstand the force caused by a 100 mile-per-hour wind with a gust factor of 1.3 and made of seamless shaft aluminum or galvanized steel.

C. Receptacles: Provide receptacles in light standards where shown. Provide in accordance with the following:

1. Receptacles housed in cast iron hot-dipped galvanized boxes and watertight, heavy duty type with screwed caps.

2. Switches enclosed in hot-dipped galvanized cast iron boxes. Where shown on the Contract Drawings, provide switches with fuses.

3. Where shown on the Contract Drawings, provide fused applications with watertight, in-line fuse kits similar to buchanan breakaway street light connectors.

4. Where transformer based poles are specified, provide transformers and bases that are physically coordinated to allow adequate clearance for all conduit entries, wires, splices and terminations.

2.07 REINFORCED CONCRETE

A. Provide concrete for pole foundations in accordance with Section 03 30 00 - Cast-in-Place Concrete, and the concrete steel reinforcement in accordance with Section 05 12 00 - Structural Steel Framing.

2.08 FIXTURE SCHEDULE

A. Provide light fixtures as specified in the fixture schedule.

PART 3 EXECUTION

3.01 INSTALLATION OF OUTDOOR LIGHTING

A. Install fixtures at locations indicated on the Contract Drawings. Adjust fixture locations where necessary to clear conflicts and obstructions.

B. Perform excavation and backfilling for fixture poles in accordance with the requirements of Section 31 23 16 and Section 31 23 23.

C. Install fixture poles on reinforced concrete foundations, in accordance with standard procedures as recommended by the manufacturer.

D. Wire poles with the provided strain relief. Install a green grounding conductor with each circuit. Do not ground by conduit method.

3.02 FIELD TESTS

A. After installation, field test the completed outdoor lighting system for operation and conformance. The field tests shall be witnessed by the Commissioner and certified by the Contractor. Provide testing consisting of the following:

1. Wiring continuity test
2. Branch circuit load balance test
3. Fixture and photo cell operation test

B. Provide a field test report identifying the tests performed and the results obtained.

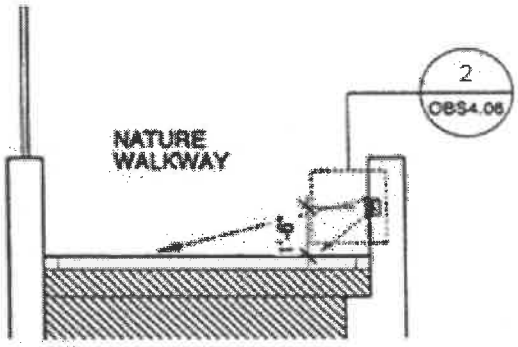
3.03 CLEANING OF OUTDOOR LIGHTING

A. Steel Surfaces: Prior to final completion of the Work, thoroughly clean all steel surfaces and retouch all scratches and abrasions. Use the same paint as used for shop finishing coats.

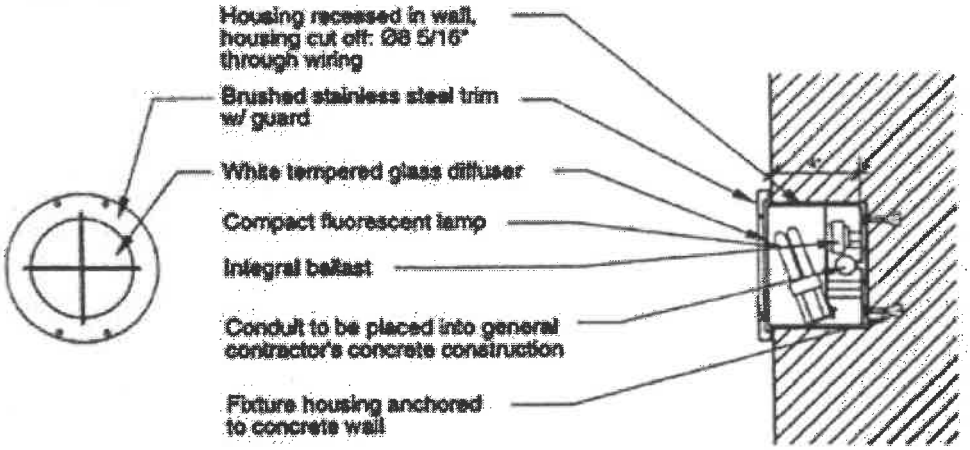
B. Clean luminaires inside and out to remove construction dust prior to substantial completion.

C. Relamp all fixtures prior to substantial completion.

3.04 FIXTURE TYPE: EUPL3

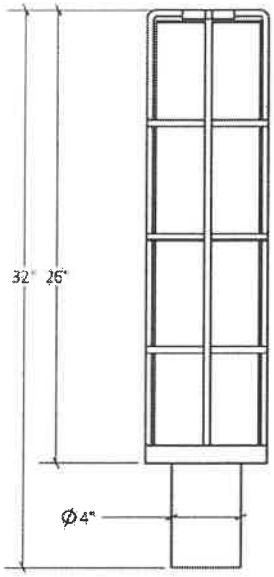


1 **NATURE WALKWAY SECTION**
Scale: 1/8" = 1'-0"

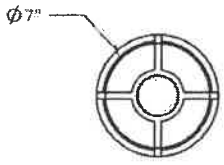


2 **FIXTURE EUPL3 DETAIL**
Scale: 1-1/2" = 1'-0"

3.05 FIXTURE TYPE: WFL3A



Elevation View
Scale 1:8



Plan View
Scale 1:8



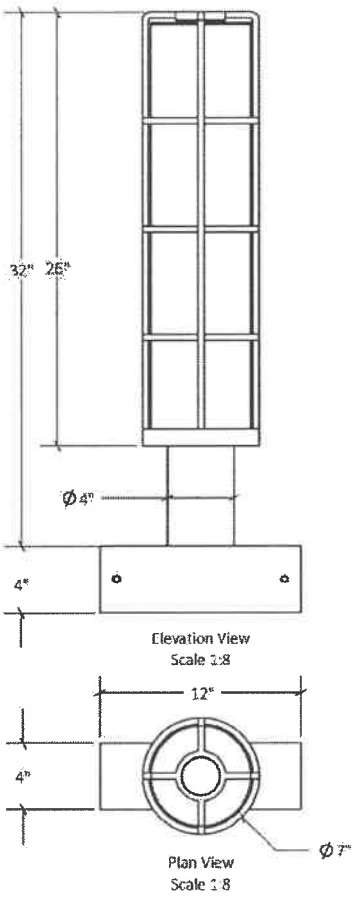
Perspective View
N.T.S.

Project: Newtown Nature Creek Walk - Phase 3

BASIS OF DESIGN
18513-SEC-A Concept by Crenshaw

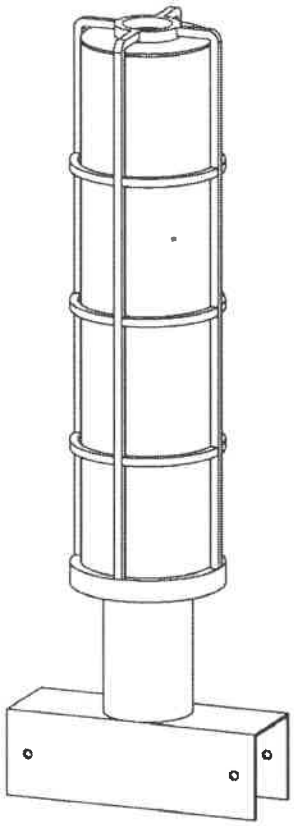
Width: Ø7"
Height: 2'-8"
Finish: Satin Stainless Steel
Lens: Clear Acrylic w/ Inner Colored Glass Filter
Lamping: LED
CSA: Wet Location
Notes:

3.06 FIXTURE TYPE: WFL3B



Elevation View
Scale 1:8

Plan View
Scale 1:8



Perspective View
N.T.S.

Project: Newtown Nature Creek Walk - Phase 3

BASIS OF DESIGN
18513-SEC-B Concept by Crenshaw

Width: Ø7"
Height: 2'-8"
Finish: Satin Stainless Steel
Lens: Clear Acrylic w/ Inner Colored Glass Filter
Lamping: LED
CSA: Wet Location
Notes:

END OF SECTION 26 56 00

SECTION 31 09 16
DRIVEN PILE LOAD TESTS

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.

1.2 SUMMARY

A. The Contractor shall provide all equipment, labor, materials and incidental items necessary to perform the pile load tests as indicated on the Contract Drawings or specified herein.

1.3 REFERENCES

A. ASTM D3966 - Test Method for Piles Under Lateral Loads.

B. New York City Building Code (NYCBC).

1.4 PERFORMANCE REQUIREMENT

A. Pile load tests shall conform to the New York City Building Code, and these Specifications. Where the requirements of the Specifications are more rigorous, they shall be adhered to.

B. The working (Design) load of the piles shall be as shown on the Contract Drawings.

C. Tested piles which pass the load tests and are within tolerance at permanent locations shall be reset for use as permanent piles. The Contractor shall obtain the Commissioner's approval for each pile so tested and so reset.

D. Piles which do not meet the requirements for the working load of the piles shall be rejected and additional testing shall be performed on other piles at no additional cost to the City of New York.

1.5 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions. Working drawings and shop drawings shall include, but not be limited to:

1. Full description of test method and equipment.
2. Load type and loading equipment.
3. Safety devices.
4. Calibration equipment.

1.6 SCHEDULE OF OPERATIONS

A. Load tests of piles shall be scheduled sufficiently in advance of production pile driving to prevent delay in the progress of the work.

B. No production piles shall be driven until the load tested piles have been accepted by the Commissioner.

1.7 QUALIFICATIONS

A. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

1.8 VIBRATION MONITORING

A. When driving piling, the Contractor shall provide the monitoring stations at locations shown on the Contract Drawings or specified in the Specifications.

1.9 EXAMINATION OF THE SITE

A. Prior to starting operations, an examination of the site shall be performed by the Contractor to identify conditions that have changed since the bid phase that will interfere with the work. Such conditions shall be reported to the Commissioner for resolution.

PART II - PRODUCTS

2.1 PILE LATERAL LOAD TEST

A. Pile lateral load tests, when shown on the Contract Drawings shall be in accordance with ASTM D3966 and NYCBC. The load tests at locations shown on the Contract Drawings or specified in the Specifications shall be made on test piles placed to the tip elevation and/or driving criteria used for establishing lengths of piles, unless otherwise directed by the Commissioner. Loading, testing and recording of data shall be under the direct supervision of the Special Inspector.

B. The proposed testing apparatus and structures to be used in making the pile load tests shall be designed by the Professional Engineer engaged by the Contractor. The Contractor shall prepare complete detailed working drawings showing how the lateral load test will be performed including the layout of reaction, jack, and test pile. The drawings shall be signed and sealed by the Professional Engineer and shall include date and calibration curves of all equipment and instruments. The entire test setup and procedure will be subject to the approval of the Commissioner.

C. Piles shall be tested as free-head piles. Lateral load tests shall be conducted in accordance with Section 6.1 of ASTM D3966 until either 1 inch of gross lateral movement has occurred or the test load has reached 200 percent of the design load. For both cases, the allowable lateral pile load shall be 50 percent of the test value.

1. Reaction for the lateral load test may be an adjacent pile.

2. Movement shall be measured with dial gages to the nearest 0.001 inch referenced to a beam which is supported at least 10 feet away from the test pile and reactions. If an adjacent permanent steel H-pile is used as the reaction pile, both piles shall be instrumented for movement.

3. For H-piles, the direction of the test shall be as indicated in the Specification or the Contract Drawings.

PART III - EXECUTION

3.1 WITNESSING

A. The pile installation and test program will be witnessed by the Special Inspector engaged by the City of New York.

B. The Special Inspector shall keep records for confirmation of the test pile driving. The Contractor shall cooperate with the Special Inspector so that all necessary data may be obtained. The data will include the following:

1. Type and dimensions of the pile.

2. Location and pile number.

3. Type and size of hammer.

4. Steam or air pressure used to activate hammer.

5. Type and dimensions of the cushion block.

6. Actual number of blows per minute delivered by the hammer.

7. Number of blows required for each foot of penetration, and blows per inch for last six (6) inches.

8. Elevation of ground.

9. Elevation to which the pile penetrated under its own weight and under the weight of the hammer.

10. Final elevation of tip of pile.

11. Length of delays due to splicing or for any other reason and elevation of pile tip at such time.

12. Location of pile splices.

13. Such other information as the Engineer may deem necessary.

C. The Special Inspector will keep records of the test loading and unloading data and determine its acceptance.

3.2 INSTALLATION OF PRODUCTION PILES

A. The method of installing the permanent piles shall be the same as that used to install the successfully tested piles, except where a change in procedure is ordered by the Commissioner.

B. The installation procedure established in the test program shall not be changed without the written approval of the Commissioner.

3.3 REMOVALS

A. Upon completion of the test program, the Contractor shall remove all equipment, and remove or cut off piles not in permanent locations or rejected and restore the site to a condition satisfactory to the Commissioner.

B. Test piles and reaction piles which are driven at non-permanent pile locations shall be removed or abandoned. Abandoned piles shall be cut off at least 18 inches below the bottom of the foundation or 3 feet below finished grade, whichever is deeper.

END OF SECTION 31 09 16

SECTION 31 09 17
DYNAMIC PILE TESTING

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.

1.2 SUMMARY

A. This Section specifies requirements for dynamic testing of piles.

B. Testing shall be performed by a qualified geotechnical Engineer engaged by the Contractor on piles indicated on the Contract Drawings. Testing shall be performed in the presence of the Special Inspector.

C. The Contractor shall modify pile driving system or replace hammer if test results show that the pile driving system does not achieve the specified minimum penetration, energy and load requirements.

1.3 REFERENCES

A. ASTM D4945-12 Standard Test Method for High-Strain Dynamic Testing of Deep Foundations

1.4 RELATED SPECIFICATIONS

A. Section 310916 Driven Pile Load Tests
B. Section 316216 Steel H-Piles

1.5 QUALIFICATIONS

A. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

1.6 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. The name and qualifications of the engineer performing the dynamic pile testing.

C. Proposed Pile Driving Analyzer (PDA) testing procedure and equipment.

D. PDA report describing the testing equipment and procedure, ultimate pile capacity and the information listed in Article 3.1B.

PART II - PRODUCTS

2.1 PILE DRIVING ANALYZER (PDA)

A. The PDA instrumentation equipment consists of two accelerometers and two strain gauges, the pile driving analyzer, a seven-channel cassette recorder, and an oscilloscope. The accelerometers and strain gauges are attached to the test piles with six bolts through pre-drilled and threaded holes. The wires from each gauge are collected at a connection box which hangs from the pile hammer using a chain. A single cable runs from the connection box to the PDA located on the ground.

PART III - EXECUTION

3.1 DYNAMIC PILE TESTING

A. During pile driving operations, and prior to production pile driving dynamic measurements shall be taken by the Contractor's Engineer of force and acceleration at the tops of selected piles shown on the Contract Drawings. Readings will be taken using the equipment described in 2.1 A. All work associated with providing the instrumentation and obtaining the measurements shall be performed by the Contractor's testing Engineer.

B. Measurements to be obtained shall provide the following information:

1. Available kinetic energy developed by the hammer.
2. Transferred energy (efficiency) from hammer to pile;
3. Predicted ultimate static bearing capacity;
4. Maximum compressive force in pile;
5. Maximum tension force in pile;
6. Maximum impact velocity at pile top;
7. Maximum acceleration at pile top.

C. The PDA testing shall be obtained for a minimum of the last consecutive 3 feet of pile penetration.

D. If dynamic measurements indicate that the pile driving system does not provide a minimum transferred energy of 60% of the rated energy, the Contractor shall either replace the hammer or make whatever modifications to the pile driving system necessary, subject to approval of commissioner, Special Inspector and Contractor's testing Engineer, to provide the minimum transferred energy.

END OF SECTION 31 09 17

SECTION 31 23 16
EXCAVATION - EARTH AND ROCK

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. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
1. Section 31 23 23 - Backfilling

1.2 SECTION INCLUDES

A. All work necessary for the removal and disposal of piping, equipment and roadways, or any part thereof including masonry, steel, reinforced concrete, plain concrete, and any other material or equipment shown or specified to be removed.

B. Soil sample analysis from this site completed as part of the previous Phase II SCI investigation determined that the Subject Site soils are contaminated; however, additional characterization will be required as per requirements of the selected disposal facility. All excavated soil shall be disposed of at a licensed facility permitted to accept the soil at no additional cost to the City and shall not be allowed to stockpile it on site for reuse.

C. There are materials present within the subsurface of the site that will require special handling and other safeguards in order to minimize chemical exposure hazard to site workers during excavation and prevent environmental impacts to offsite areas.

D. Excavations will be performed to a minimum depth of three feet below current grade or deeper as shown on drawings, and to meet Site grade(s) and to install proposed utilities and features. The excavated soil will be classified for waste characterization parameters according to disposal facility requirements, transported under appropriate regulatory permits, and disposed of or recycled at a licensed facility permitted to accept the soil.

E. All soil removal operations will be performed in accordance with NYSDEC solid waste regulations. The final remedial action will be the removal of impacted soil to the extent practical considering the proposed new construction.

F. The contractor shall take precautionary measures to control volatile vapors when working below grade. Polyethylene sheeting of 6 mil. minimum thickness shall be used to cover all odorous soil at the active workface during non-working hours.

G. A Community Air Monitoring Plan (CAMP) shall be implemented in accordance with NYSDEC DER-10 Regulations during remedial activities. The CAMP will include real-time monitoring for

VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress.

H. Should dewatering become necessary during construction, the contractor shall obtain a NYCDEP sewer discharge permit. If discharge into surface waters is required during dewatering, it may be done under the appropriate NYSDEC State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis may be required to satisfy NYCDEP or NYSDEC requirements prior to discharge into sewers or surface waters. Groundwater collected through dewatering operations during construction shall be treated on-site, if necessary, prior to discharge.

1.3 DEFINITIONS

A. Earth: "Earth" includes all materials which, in the opinion of the COMMISSIONER, do not require blasting, barring, or wedging for their removal from their original beds. Specifically excluded are all ledge and bedrock and boulders or pieces of masonry larger than one cubic yard in volume.

B. Rock: "Rock" includes all materials which, in the opinion of the COMMISSIONER, require blasting, barring or wedging for removal from their original beds and which have compressive strengths in their natural undisturbed state in excess of 300 psi. Boulders or masonry larger than one cubic yard in volume are classed as rock excavation.

1.4 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Dewatering Excavation Plan: Develop an excavation dewatering plan that considers site ground and groundwater conditions, the type and arrangement of the equipment to be used and the proper method of groundwater disposal. Prepare the dewatering plan before beginning excavations below groundwater. Maintain one copy of the dewatering plan at the project site to be available for inspection while all dewatering operations are underway.

C. Contractors shall provide a daily contractor's report to the Commissioner that details the remedial actions or construction activities that have taken place that day.

D. Other documentation that is to be submitted to the Resident Engineer on a daily or weekly basis shall include the following:

1. Waste Characterization Testing Procedures
2. All laboratory data with chain of custody forms
3. All air monitoring results
4. All waste manifests
5. All non-hazardous and hazardous waste manifests, bills or lading
6. All soil or backfill weight tickets
7. Volume of water generated and/or disposed of

8. Any personnel air monitoring data
9. Any violations or notice of deficiencies
10. Any other regulatory notifications or documents

1.5 SITE CONDITIONS

A. Geotechnical Investigation: A geotechnical investigation and report was prepared by Yu-Parsons Brinkerhoff and is included as Appendix 1 of these specifications. This report is provided for information only but is not guaranteed as to its accuracy or completeness.

B. Actual Conditions: Make any geotechnical investigations deemed necessary to determine actual site conditions.

C. Underground Utilities: Locate and identify all existing underground utilities prior to the commencement of Work.

D. Quality and Quantity: Make any other investigations and determinations necessary to determine the quality and quantities of earth and rock and the methods to be used to excavate these materials.

PART II – PRODUCTS

Not Used

PART III - EXECUTION

3.1 GENERAL

A. Clearing: Clear opencut excavation sites of obstructions preparatory to excavation. Clearing includes removal and disposal of vegetation, trees, stumps, roots and bushes, except those specified to be protected during trench excavation.

B. Banks: Shore or slope banks to the angle of repose to prevent slides or cave-ins in accordance with Section 31 25 00.

C. Hazardous Materials: If hazardous materials not specifically shown or noted are encountered, proceed in accordance with Section 02 80 13.

3.2 TRENCH EXCAVATION

A. Preparation: Properly brace and protect trees, shrubs, poles and other structures which are to be preserved. Unless shown or specified otherwise, preserve all trees and large shrubs. Hold damage to the root structure to a minimum. Small shrubs may be preserved or replaced with equivalent specimens.

B. Adequate Space: Keep the width of trenches to a minimum, however provide adequate space for workers to place, joint and backfill the pipe properly.

1. Do not allow the clear width of the trench at the level of the top of the pipe to exceed the sum of the outside diameter of the pipe barrel plus 20 inches for pipe 4 through 24 inches in diameter nor the outside diameter of the pipe barrel plus 2 feet for pipe more than 24 inches in diameter, unless otherwise approved.

2. In sheeted trenches, measure the clear width of the trench at the level of the top of the pipe to the inside of the sheeting.

3. Should the maximum trench widths specified above be exceeded without written approval, provide concrete cradle or encasement for the pipe as directed. No separate payment will be made for such concrete cradle or encasement.

C. Depth: Excavate trenches to a minimum depth of 6 inches below the bottom of the pipe or the bottom of encasement for electrical ducts, unless otherwise shown, specified or directed, so that bedding material can be placed in the bottom of the trench and shaped to provide a continuous, firm bearing for duct encasement, pipe barrels and bells.

D. Length of Excavation: Keep the open excavated trench preceding the pipe or electrical duct laying operation and the unfilled trench, with pipe or duct in place, to a minimum length which causes the least disturbance. Provide ladders for a means of exit from the trench as required by applicable safety and health regulations.

E. Water: Allow no water to rise in the trench excavation until sufficient backfill has been placed to prevent pipe or duct flotation.

3.3 FINISHED EXCAVATION

A. Finish: Provide a reasonably smooth finished surface for all excavations, which is uniformly compacted and free from irregular surface changes.

B. Finish Methods: Provide a degree of finish which is ordinarily obtainable from blade-grade operations, except as otherwise specified in Section 31 23 23.

3.4 PROTECTION

A. Traffic and Erosion: Protect newly graded areas from traffic and from erosion.

B. Repair: Repair any settlement or washing away that may occur from any cause, prior to acceptance. Re-establish grades to the required elevations and slopes.

C. Other Requirements: Conduct all Work in accordance with the environmental protection requirements specified in the DDC General Conditions.

3.5 AUTHORIZED ADDITIONAL EXCAVATION

A. Additional Excavation: Carry the excavation to such additional depth and width as authorized in writing, for the following reasons:

1. In case the materials encountered at the elevations shown are not suitable.

2. In case it is found desirable or necessary to go to an additional depth, or to an additional depth and width.

B. Refill Materials: Refill such excavated space with either authorized Class D concrete or compacted select fill material.

C. Compaction: Where necessary, compact fill materials to avoid future settlement.

3.6 UNAUTHORIZED EXCAVATION

A. Stability: Refill any excavation carried beyond or below the lines and grades shown, except as specified in the subsection headed "Authorized Additional Excavation", with such material and in such manner as may be approved in order to provide for the stability of the various structures.

B. Refill Materials: Refill spaces beneath all manholes, structures, pipelines, or conduits excavated without authority with Class D concrete or compacted select fill material, as approved.

3.7 SEGREGATION STORAGE AND DISPOSAL OF MATERIAL

A. Stockpile of excavated material shall not be allowed. Transport and dispose of all excavated material at an off site disposal location. Off-site disposal locations shall be identified and all required testing, permits and approvals shall be obtained at least 30 days before excavation can commence.

3.8 REMOVAL OF WATER

A. Water Removal: At all times during the excavation period and until completion and acceptance of the WORK at final inspection, provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation or other parts of the WORK.

B. Dry Excavations: Keep the excavation dry.

C. Water Contact: Allow no water to rise over or come in contact with masonry and concrete until the concrete and mortar have attained a set and, in any event, not sooner than 12 hours after placing the masonry or concrete.

D. Discharge of Water: Dispose of water pumped or drained from the Work in a safe and suitable manner without damage to adjacent property or streets or to other work under construction.

E. Protection: Provide adequate protection for water discharged onto streets. Protect the street surface at the point of discharge.

F. Sanitary Sewers: Discharge no water into sanitary sewers.

G. Storm Sewers: Discharge no water containing settleable solids into storm sewers.

H. Repair: Promptly repair any and all damage caused by dewatering the Work.

END OF SECTION 31 23 16

SECTION 31 23 23
BACKFILLING

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. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:

1.	Section 31 23 16	–	Excavation – Earth and Rock
2.	Section 32 93 20	–	Planting Soil Mixes
3.	Section 32 93 30	–	CU Structural Soil

1.2 SECTION INCLUDES

A. Backfill all excavation to the original surface of the ground or to such other grades as may be shown or required. See drawings for backfill materials and fill depths. Obtain approval before backfilling against masonry structures. Remove from all backfill, any compressible, putrescible, or destructible rubbish and refuse and all lumber and braces from the excavated space before backfilling is started. Leave sheeting and bracing in place or remove as the work progresses.

1.3 EQUIPMENT LIMITATIONS

A. Do not permit construction equipment used to backfill to travel against and over cast-in place concrete structures until the specified concrete strength has been obtained, as verified by concrete test cylinders. In special cases where conditions warrant, the above restriction may be modified providing the concrete has gained sufficient strength, as determined from test cylinders, to satisfy design requirements for the removal of forms and the application of load.

1.4 REFERENCES

A. Codes and standards referred to in this Section are:

1.	ASTM D 1557	-	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

1.5 SUBMITTALS

A. Provide all submittals, including the following in accordance with the General Conditions.

1. Certified laboratory reports of all proposed backfill materials.

PART II - PRODUCTS

2.1 BACKFILL MATERIAL - GENERAL

A. General: Backfill with sound materials, free from waste, organic matter, rubbish, boggy or other unsuitable materials.

B. General Materials Requirements: Conform materials used for backfilling to the requirements specified. Follow common fill requirements whenever drainage or select fill is not specified. Determine and obtain the approval of the appropriate test method where more than one compaction test method is specified.

C. Frozen Materials: Do not use frozen material for backfilling.

D. Clean fill for this Project should be certified through laboratory analyses for VOCs, SVOCs, TAL Metals, PCBs, and pesticides at a sample frequency of 1 sample per 250 cubic yards and/or as per the Department of Parks and Recreation soil sampling requirements. The results will be compared to 6 NYCRR Part 375 Restricted Residential Use Criteria and will be provided to the NYCDEP prior to import to the Site. For all landscaped areas or exposed soil areas, a minimum of two (2) feet of clean fill will be placed.

E. Prior to backfilling, the top of the residual soil/fill will be defined by placing a demarcation layer. The demarcation layer should consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer.

2.2 DRAINAGE FILL

A. Materials for Drainage Fill: Use clean gravel, crushed stone, or other suitable material conforming to the gradation specified for drainage fill. Clay and fine particles are unacceptable in drainage fill. Provide drainage fill of a grade between the following limits:

U.S. Standard Sieve	Percent Passing by Weight
1-1/2 inch	100
1 inch	95-100
1/2 inch	45-65
#4	5-15
#16	0-4

2.3 SELECT FILL

A. Materials for Select Fill: Use gravel, crushed stone, limestone screenings or other granular or similar material as approved which can be readily and thoroughly compacted to 95 percent of the maximum dry density obtainable by ASTM D 1557.

1. Grade select fill between the following limits:

U.S. Standard Sieve	Percent Passing by Weight
2 inch	100
1-1/2 inch	90-100
1 inch	75-95
1/2 inch	45-70
#4	25-50
#10	15-40
#200	5-15

2. Very fine sand, uniformly graded sands and gravels, or other materials that have a tendency to flow under pressure when wet are unacceptable as select fill.

2.4 COMMON FILL

A. Materials for Common Fill: Material from on-site excavation may not be used as common fill. Select fill may be used as common fill at no change in the Contract Price.

B. Granular Materials: Granular material, which is fairly well graded between the following limits may be used as granular common fill:

U.S. Standard Sieve	Percent Passing by Weight
3 inch	100
#10	50-100
#60	20-90
#200	0-20

C. Material Approval: All material used as common fill is subject to approval. Import whatever off-site material is required which conforms to the specifications and at no additional cost.

2.5 PIPE BEDDING

A. Gradation for Small Piping: For pipe 18 inches or less in diameter, comprise pipe bedding of material 90 percent of which will be retained on a No. 8 sieve and 100 percent of which will pass a 1/2 inch sieve and be well graded between those limits.

B. Gradation for Large Piping: For pipe larger than 18 inches in diameter, use the same pipe bedding material as specified for smaller pipe or use a similar well graded material 90 percent of which will be retained on a No. 8 sieve and 100 percent of which will pass a 1-inch sieve.

PART III – EXECUTION

3.1 ELECTRICAL DUCT AND PRECAST MANHOLE BEDDING

A. Bedding Compaction: Bed all electrical ducts and precast manholes in well graded, compacted, select fill conforming to the requirements except as otherwise shown, specified, or required. Extend electrical duct bedding a minimum of 6 inches below the bottom of the duct encasement for the full trench width. Compact bedding thickness no less than 6 inches for precast concrete manhole bases.

B. Concrete Work Mats: Cast cast-in-place manhole bases and other foundations for structures against a Class D concrete work mat in clean and dry excavations, unless otherwise shown, specified or required.

C. Bedding Placement: Place select fill used for bedding beneath electrical ducts and precast manhole bases, in uniform layers not greater than 9 inches in loose thickness. Thoroughly compact in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.

D. Use of Select Fill: Bed existing underground structures, tunnels, conduits and pipes crossing the excavation with compacted select fill material. Place bedding material under and around each existing underground structure, tunnel, conduit or pipe and extend underneath and on each side to a distance equal to the depth of the trench below the structure, tunnel, conduit or pipe.

3.2 PIPE BEDDING

A. Hand Placement: Place select fill pipe bedding by hand from the bottom of the excavation to 1 foot over the top of the pipe in uniform layers not greater than 6 inches in loose thickness. Tamp under pipe haunches and thoroughly compact pipe bedding in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density as determined by ASTM D 1557 (Modified Proctor).

B. Stone Placement: Do not place large stone fragments in the pipe bedding or backfill to 1 foot over the top of pipes, nor nearer than 2 feet at any point from any pipe, conduit or concrete wall.

C. Unallowed Materials: Pipe bedding containing very fine sand, uniformly graded sands and gravels, or other materials that have a tendency to flow under pressure when wet is unacceptable.

3.3 BEDDING PLACEMENT AND BACKFILL FOR PIPE IN SHORT TUNNEL

A. Bed pipelines or electrical ducts placed in short tunnels in select fill or Class D concrete. Completely fill the remainder of the annular space between the outside of the pipe wall and the tunnel wall with select fill, suitable job-excavated material, or Class D concrete, as approved. Suitably support pipelines or ducts in short tunnels to permit placing of backfill suitably tamped in place.

3.4 TRENCH BACKFILL

A. General: Backfill trenches from 1 foot over the top of the pipe, from the top of electrical duct bedding or as shown to the bottom of pavement base course, subgrade for lawns or lawn replacement, to the top of the existing ground surface or to such other grades as may be shown or required.

B. Materials: Provide select fill, suitable job-excavated material or other material, as specified and as approved for trench backfill.

C. Depth of Placement - General: Except under pavements, walkways, railroad tracks, and street or highway appurtenances, or as otherwise specified, place trench backfill in uniform layers not greater than 9 inches in loose thickness and thoroughly compact in place using suitable mechanical or pneumatic equipment. Compact backfill to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.

D. Depth of Placement - Traffic Areas and Under Utilities: Where pavements, walkways, railroad tracks and street or highway appurtenances are to be placed over trenches and under utilities or utility services crossing the trench, provide trench backfill using select fill placed in uniform layers not greater than 9 inches in loose thickness and thoroughly compacted in place with equipment as specified above. Compact backfill to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.

E. Depth of Placement - Undeveloped Areas: In nondeveloped areas and where select fill material or hand-placed backfill are not specified or required, place suitable job excavated material or other approved backfill in lifts not exceeding 12 inches in loose thickness. When the trench is full, consolidate the backfill by jetting, spading, tamping or puddling to ensure complete filling of the excavation. Mound the top of the trench approximately 12 inches to allow for consolidation of backfill.

F. Dropping of Material on Work: Do trench backfilling work in such a way as to prevent dropping material directly on top of any conduit or pipe through any great vertical

distance. Do not allow backfilling material from a bucket to fall directly on a structure or pipe and, in all cases, lower the bucket so that the shock of falling earth will not cause damage.

G. Distribution of Large Materials: Break lumps up and distribute any stones, pieces of crushed rock or lumps which cannot be readily broken up, throughout the mass so that all interstices are solidly filled with fine material.

3.5 DRAINAGE BLANKET

A. Drainage Fill Placement: Provide a drainage blanket where shown consisting of drainage fill.

1. Place drainage fill underneath all structures and adjacent to structures where pipes, connections, electrical ducts and structural foundations located within this fill, in uniform layers not greater than 8 inches in loose thickness. Compact drainage fill with suitable mechanical or pneumatic equipment to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.

2. Place drainage fill adjacent to structures in all areas not specified above in uniform layers not greater than 8 inches in loose thickness. Compact drainage fill with suitable mechanical or pneumatic equipment to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.

3.6 EARTH EMBANKMENTS

A. Use of Cohesive Materials: Make all earth embankments of approved cohesive common fill material.

1. Place fill in uniform layers not greater than 10 inches in loose thickness. Compact in place with suitable approved mechanical equipment.

2. Compact earth embankments to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.

3. Do not use cohesionless, granular material as earth embankment backfill, unless otherwise shown or required.

3.7 COMPACTION EQUIPMENT

A. Equipment and Methods: Carry out all compaction with suitable approved equipment and methods.

1. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use hand held pneumatic tampers elsewhere for compaction of cohesive fill material.

2. Compact low cohesive soils with pneumatic-tire rollers or large vibratory equipment where practicable. Use small vibratory equipment elsewhere for compaction of cohesionless fill material.

3. Do not use heavy compaction equipment over pipelines or other structures, unless the depth of fill is sufficient to adequately distribute the load.

3.8 FINISH GRADING

A. Final Contours: Perform finish grading in accordance with the completed contour elevations and grades shown and blend into conformation with remaining natural ground surfaces.

1. Leave all finished grading surfaces smooth and firm to drain.

2. Bring finish grades to elevations within plus or minus 0.10 foot of elevations or contours shown.

3.9 RESPONSIBILITY FOR AFTER SETTLEMENT

A. After settlement Responsibility: Take responsibility for correcting any depression which may develop in backfilled areas from settlement within one year after the work is fully completed. Provide as needed, backfill material, pavement base replacement, permanent pavement, sidewalk, curb and driveway repair or replacement, and lawn replacement, and perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved.

3.10 INSPECTION AND TESTING FOR SPECIAL INSPECTION OF BACKFILLING

A. Sampling and Testing for Special Inspection: Sampling and testing of all in-place backfill will be provided by a Special Inspector retained by the City of NY as specified in the DDC General Conditions.

B. Correction of Work: Correct any areas of unsatisfactory compaction by removal and replacement, or by scarifying, aerating or sprinkling as needed and recompaction in place prior to placement of a new lift.

END OF SECTION 31 23 23

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SECTION 31 25 00
SLOPE PROTECTION AND EROSION CONTROL

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. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:

1.	Section 02 41 00	-	Demolition
2.	Section 31 23 16	-	Excavation - Earth and Rock
3.	Section 31 23 23	-	Backfilling

1.2 SECTION INCLUDES

A. The requirements for providing slope protection and erosion control practices for all areas within the contract limits and other area indicated, including work designated in permits and other agreements, as specified in the DDC General Conditions.

1.3 DEFINITIONS

A. Primary System: Consists of one or more of the following components/controls: silt fence, straw bales, truck washing systems, stabilized entrances, stockpiles, sumps, pumps, piping, or other means determined by the Contract Documents. Components shall be of sufficient size to handle the temporary sediment, storm water and erosion control as required by the Contract Documents. All components/controls must be designed in conformance with the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the contractor must demonstrate equivalence to the technical standard.

B. Backup Components: Components such as backup pumps, piping and other components/controls which shall be sufficiently sized and prepared to incorporate them into the system if there is potential for the failure of a primary system component. (i.e., if generators are part of the primary system, have generators readily available in the event of a power failure.) All components/controls must be designed in conformance with the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the contractor must demonstrate equivalence to the technical standard.

1.4 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Inspection Reports: Contractor shall submit inspection reports consistent with requirements of the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities.

1. Following commencement of construction, site inspections shall be conducted by the qualified professional at least once every seven (7) calendar days.

2. Inspection reports shall be maintained in a logbook at the site.

C. The Contractor shall develop and submit to the COMMISSIONER for approval a Storm Water Pollution Prevention plan (SWPPP) prepared in accordance of the requirements of the current New York State Department of Environmental Conservation (NYSDEC) SPDES General Permit for Stormwater Discharges from Construction Activities, the current NYSDEC SPDES General Permit for Stormwater Discharges from Municipal Separate Storm Sewer System and the New York Soil and Water Conservation Society (SWCS) requirements. The SWPPP shall be developed and submitted to the COMMISSIONER for approval prior to the initiation of construction activities. The SWPPP shall include the following at a minimum:

1. Provide background information about the scope of the project, including the location, type of size of project;

2. Provide a site map for the project, including a general location map. The site map should show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site adjacent off-site material, waste, borrow or equipment storage areas; and location(s) of the storm water discharge(s);

3. Provide a description of the soil(s) present at the site;

4. Provide a construction –phasing plan describing the intended sequence of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance. Consistent with the New York Guidelines for Urban Erosion and Sediment Control, there shall not be more than five (5) acres of disturbed soil at any one time without prior written approval from the NYSDEC;

5. Provide a description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the storm water discharges;

6. Provide a description of construction and waste materials expected to be stored on-site with updates as appropriate, and a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention response;

7. Describe the temporary and permanent structural and vegetative measures to be used for soil stabilization, runoff control and sediment control for each stage of the project from initial land clearing and grubbing to project closeout;

8. Identify and show on a site map the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

9. Provide the dimensions, material specifications, and installation details for all erosion and sediment control practices, including the siting and sizing of any temporary sediment basins;

10. Identify temporary practices that will be converted to permanent control measures.

11. Provide an implementation schedule for staging temporary erosion and sediment control practices, including the timing of initial placement and the placement and the duration that each practice should remain in place;

12. Provide a maintenance schedule to ensure continuous and effective operation of the erosion and sediment control practices;

13. Provide the name(s) of the receiving water(s);

14. Provide a delineation of SWPPP implementation responsibilities for each part of the site;

15. Provide a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable; and

16. Provide any existing data that describes the storm water runoff characteristics at the site.

D. Submit copies of all required permits to the Commissioner before performing any work.

1.5 QUALITY ASSURANCE

A. Permits and Regulations:

1. Inspections. The Contractor must engage a qualified professional (a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed Professional Engineer licensed in the State of New York, or a Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist) conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following commencement of construction, site inspections shall be conducted by the qualified professional at least once every seven (7) calendar days.

2. Stabilization. The Contractor shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased.

3. Maintenance. Sediment shall be removed from sediment traps or sediment ponds whenever their capacity has been reduced by fifty (50) percent from the design capacity.

4. The SWPPP shall be kept current. If there is a significant change in construction which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP would require that the SWPPP be updated to reflect those required changes. The SWPPP would also require an amendment if the SWPPP proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the SWPPP or achieving the general objectives of controlling pollutants in storm water discharges from permitted construction activity. Additionally, the SWPPP shall be amended to identify any new subcontractor.

5. Monitoring. During the course of construction, monitoring of discharge(s) from the permitted construction activity may be required. Notification of the basis for such monitoring, the parameters and frequency at which monitoring shall occur and the associated reporting requirements will be provided as needed.

a) GP-0-08-001 prohibits the discharge of materials other than storm water and all discharges which contain a hazardous substance in excess of reportable quantities established by 40 Code of Federal Regulations (CFR) 117.3 of 40 CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act.

b) The Contractor must implement the SWPPP and retain all records for a period of at least one (1) year after construction is completed. Additionally, records would also need to be retained for at least one (1) year after construction is completed for the discharge monitoring reports if deemed necessary.

PART II – PRODUCTS

Not Used

PART III - EXECUTION

3.1 EROSION AND SEDIMENT CONTROL

A. Provide necessary precautions and facilities to protect all indicated areas within the Contract limits from discharges resulting from construction operations, excessive erosion runoff of the construction site, silting and any other contamination resulting from construction work. All components/controls must be designed in conformance with the most current version of the technical standard, New York Standards and Specifications for Erosion and Sediment Control and the New York State Stormwater Management Design Manual. Provide erosion control practices conforming to the specified requirements and to include but not limited to the following provisions:

1. Place all erosion and siltation control measures prior to or as the first step in grading.

2. Mulch and seed all storm and sanitary sewer trenches not in streets within fifteen (15) days after backfill. Do not allow more than five hundred (500) feet of trenches to be open at any one time

3. Place all excavated material on the uphill side of trenches where possible. Do not place materials in stream beds. Seed any stockpiled material which remains in place longer than thirty days with temporary vegetation and mulch.

4. Mulch and seed all temporary earth berms, diversions, erosion barriers and temporary stockpiles with temporary vegetative cover within 10 days after grading.

5. Do not stockpile or otherwise place dredged, excavated or other material, at any time, in or near a stream bed which may increase the turbidity of the water. If turbidity producing materials are present, hold surface drainage from cuts and fills within the construction limits and from borrow and waste disposal areas in suitable sedimentation ponds or grade surface drainage to control erosion

within acceptable limits. Provide and maintain temporary erosion and sediment control measures such as berms, dikes, drains, or sedimentation basins, if required to meet the above standards, until permanent drainage and erosion control facilities are completed and operative. Hold to a minimum the area of bare soil exposed at any one time by construction operations.

6. Runoff from stockpiling or truck washing operation cannot enter any offsite or onsite catch basins. Such discharge, unless permitted, is in violation of NYCDEP rules and regulations governing combined and/or storm sewer usage. Catch basins that may be impacted by construction shall be protected and inspected on a weekly basis.

7. Drain wet dredged material for a minimum of seven (7) days. Store the material for drainage to a maximum height of four (4) feet.

8. Provide temporary erosion and sediment control measures to include but not be limited to the following:

   a. Installation (and ultimate removal) of silt screens.
   b. Straw bales and silt traps around construction areas for all required structures.

   c. Diked area with earth berm and silt trap for draining dredged material.

   d. Straw bales with silt traps along top of slope of fill area plus seeding and mulching of entire fill area not otherwise protected.

3.2 FIELD QUALITY CONTROL

A. Inspections: The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and areas where vehicles exit the site consistent with the requirements of the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities.

1. Inspection Reports: For each inspection conducted, the Contractor shall prepare an inspection report based on the requirements of the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities. The inspection report should include, but is not limited to name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SSCP, maintenance performed, and actions taken. The report shall be furnished to the Commissioner. Copies of the inspection reports shall be maintained on the job site with the SWPPP.

END OF SECTION 31 25 00

SECTION 31 32 19
DEMARCATION FABIC

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.

1.2 SUMMARY

A. This work includes but not is not limited to the following:
   1. Supply and installation demarcation fabric.

1.3 RELATED SPECIFICATIONS

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Planting: Section 32 93 30

D. CU Structural Soil: Section 32 91 13

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data: Submit manufacturer's technical information for the following items:
   1. Demarcation fabric.

PART II - PRODUCTS

2.1 DEMARCATION FABRIC

A. Material shall consist of an orange square or rectangular grid mesh conforming to the following requirements:

Material:	High density polyethylene mesh
Color:	Bright orange
Mesh Size:	1-1/2 inch x 1-1/2 inch maximum opening size
Tensile yield:	3,000 psi minimum
Ultimate tensile strength:	2,000 psi minimum
Tensile Strength:	120 lbs/ft minimum
Ultraviolet resistance:	Fully stabilized
Roll Size:	48 inch minimum roll width

2.2 WIRE STAPLES

A. Staples shall consist of 12-inch lengths of No. 11 gauge wire bent to form a "U", or other wire staples as approved.

PART III - EXECUTION

3.1 COORDINATION

A. Coordination: Coordinate the work of this Section with other work of the Project and with work of other Contractors. Such coordination shall include but not be limited to:
   1. Location of all underground utility lines and structures.
   2. Scheduling of fill and planting operations.

3.2 PREPARATION OF SUB-GRADE

A. Verify as-constructed or existing sub-grade elevation and perform additional grading operations as necessary to bring the sub-grade to a true, smooth, slope parallel to the finished grade, at all areas to receive the demarcation fabric.

B. Clean sub-grade and dispose of all debris prior to placement of demarcation fabric.
   1. Remove all large clods, lumps, brush, roots, stumps, litter, trash, and other foreign material and stones 2 inches in diameter or larger.

   2. Dispose of removed material legally off-site.

3.3 PLACEMENT OF FABRIC

A. Mesh shall be placed over prepared subgrade at all areas shown on the Drawings or as directed by the Commissioner. Mesh shall be spread without stretching so that it lays loosely on the subgrade and in contact with the grade at all points. Edges and ends shall always be overlapped 6".

B. Mesh shall be held tightly to the soil by staples driven firmly into the ground. Staples shall be driven flush with the finished grade. Staples shall be spaced 18" to 24" apart throughout to secure the mesh to the ground, including at roll ends and at other critical areas as determined by the Commissioner.

C. Soil backfill shall then be carefully placed over the mesh to prevent dislocation of the fabric. Installation of backfill shall be as specified under the respective items.

D. No equipment, materials or machinery shall be placed on or be transported over exposed mesh.

E. If the mesh is damaged during installation, the damaged portion shall be removed and the damaged area shall be covered with a patch of new mesh which shall overlap the undamaged mesh by at least six (6") inches in all directions.

3.4 CLEAN-UP

A. After completion of the work, the Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

END OF SECTION

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SECTION 31 62 16
STEEL H-PILES

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.

1.2 SUMMARY

A. The Contractor shall furnish, install, drive and cut off steel H-piles as indicated on the Contract Drawings, and as specified herein.

B. Carry out demolition so that adjacent structures, which are to remain, are not damaged. Schedule the work so as not to interfere with the day to day operation of the existing facilities. Do not block doorways or passageways in existing facilities.

C. Provide dust control and make provisions for safety.

1.3 RELATED SPECIFICATIONS

A. Section 310916 Driven Pile Load Tests

B. Section 310917 Dynamic Pile Testing

1.4 REFERENCES

A. ASTM A36 Carbon Structural Steel

B. ASTM A572 High-Strength Low-Alloy Columbium-Vanadium Structural Steel

C. AWS D1.1 Structural Welding Code.

D. New York City Building Code (NYCBC).

1.5 PERFORMANCE REQUIREMENTS

A. Furnishing and installation of the H-piles shall conform to the requirements of the New York City Building Code, and these Specifications.

B. Pile design loadings, sizes and weights of steel H-piles shall be as shown on the Contract Drawings or specified in the Specifications. Pile ends shall be as shown on the Contract Drawings or as specified in the Specifications.

C. The Contractor shall drive test piles as specified in Article 1.6 Test Piles.

D. Dynamic pile testing, when required by the Contract Documents shall be performed in accordance with Specification 310917 – Dynamic Pile Testing.

E. Load tests, when required by the Contract Documents shall be performed in accordance with Specification 310916 – Driven Pile Load Tests.

1.6 TEST PILES

A. The Contractor shall be responsible for the proper length of piles required to develop the specified loads. Available boring records are provided on the Contract Drawings. The geotechnical data report prepared for the project will be provided to the Contractor for review.

B. The Contractor shall determine the lengths of the piles required to develop the specified loads by driving test piles. The allowable load of the test piles shall be confirmed by pile dynamic testing in the field.

C. The location and number of test piles shall be as shown on the Contract Drawings or specified in the Specifications. The test piles shall be of the same material and construction as the permanent piles.

D. The Commissioner shall be notified at least forty-eight (48) hours in advance so that the Special Inspector may be present at the commencement of driving test piles.

E. The test piles, when driven in accordance with the Specifications at the location of permanent piles, will be accepted as a production pile, if approved by the Commissioner.

1.7 SUBMITTALS

A. All submittals shall conform to the requirements of the DDC General Conditions. Working drawings and shop drawings shall include, but not be limited to:

1. Pile location plan, size and numbering system.
2. Pile installation sequence.
3. Pile as-built survey.
4. Additional pile locations.

B. The Contractor shall also submit the following:

1. Details of proposed pile driving equipment.
2. Material certification for piling (Mill Test Reports).
3. Detailed welding drawings and material specifications.
4. Proposed pile splicing detail.
5. Name and qualifications of the engineer who will be performing the vibration monitoring, proposed monitoring program, monitoring equipment and plan showing monitoring stations.

1.8 PROJECT RECORD DOCUMENTS

A. Upon completion of installation of all piles, the Contractor shall submit to the Commissioner, drawings showing types and installed location of all piles, including obstructed, damaged and additional piles, as related to their column lines, center of footings or other reference points and lines, percentage out of plumb, the cutoff elevation, and length below cutoff elevation for each pile.

B. Drawings shall be the same size as the Contract Drawings.

1.9 QUALIFICATIONS

A. The contractor or subcontractor performing the work of this section must, within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

1.10 VIBRATION MONITORING

A. When driving steel piling, the Contractor shall provide the monitoring stations at locations shown on the Contract Drawings or specified in the Specifications.

B. All pile driving, removal of piling, demolition and related piling activities shall be performed in a manner so that the following criteria shall not be exceeded; peak resultant particle velocity of one-inch per second at location of sensitive instruments at the adjacent Newtown Creek Wastewater Treatment Plant and two-inches per second at concrete structures within 100 ft of pile driving activities.

C. The Commissioner reserves the right to change the locations of the monitoring stations, as required during construction. The Contractor shall engage the services of a qualified Geotechnical Consultant having experience in the monitoring of vibrations to develop a monitoring program and to install, maintain and monitor an approved vibration monitoring system.

D. Particle velocity shall be measured by using seismographs capable of measuring peak particle velocities in the range of 0.0 to 2.0 in/sec or higher. All pile driving vibrations shall be monitored for the duration of pile driving unless otherwise ordered to be discontinued by the Commissioner.

E. All vibration monitoring of specified locations shall be implemented in such a manner that peak component particle velocity can be determined shortly after instances where the vibrations exceed the above criteria. The Contractor and Commissioner shall be notified within 30 minutes after any such occurrence and the actual peak particle velocity identified.

F. Permanent vibration monitoring records of each day's work shall be maintained until the completion of the work or until such time when monitoring is ordered to be discontinued. Such records shall be turned over to the Commissioner upon completion of all vibration monitoring work. Reports shall include a tabulation of all instances of vibration levels in excess of the vibration criteria noted above.

1.11 EXAMINATION OF THE SITE

A. Prior to starting pile driving operations, the Contractor's monitoring Engineer and the Commissioner shall make a joint inspection of the accessible existing structures, pavement and improvements adjacent to the pile driving site to examine and document their present condition.

B. Photographs and measurements shall be taken by the Contractor's Engineer to record any conditions that may become the subject of possible damage claims.

C. The Contractor's Engineer shall prepare a report of such conditions, verified by the photographs, and signed by the Contractor's Engineer and the Commissioner.

PART II – PRODUCTS

2.1 STEEL H-PILES

A. Steel H-piles shall conform to the requirements of ASTM A572 Grade 50.

B. All pile welds shall be performed in accordance with the requirements of Paragraph 2.3C.

2.2 PILE TIPS

A. Pile tips as driven shall be square and blunt unless shown otherwise on the Contract Drawings or specified in the Specifications.

B. Plates for pile tip reinforcement, if required to obtain the desired penetration, shall conform to the requirements of ASTM A36. Prefabricated cast steel points may be used as an alternative to plates, subject to the Commissioner's approval. Cast steel points shall be installed as per the manufacturer's instructions.

2.3 SPLICES

A. Field splices should be avoided. Where necessary, one splice shall be permitted per length of pile, unless indicated otherwise on the Contract Drawings.

B. Splices shall be engineered and constructed to maintain the true alignment and position of the pile sections.

1. Splices shall be made with full penetration welds to develop the full strength of the pile.

2. Special prefabricated splice sleeves may be used as an alternative to the full penetration weld. Splices shall be installed as per the manufacturer's instructions. The Contractor shall submit, for the Commissioner's approval, splicer type and manufacturer's recommendations.

3. Splices shall develop full strength of the member.

4. Length of pile to be spliced shall be secured in proper alignment so that no eccentricity results.

5. Details of the splices shall be submitted by the Contractor for the Commissioner's approval.

C. Shop and field welding shall be performed in accordance with the requirements of:

1. AWS D1.1 Structural Welding Code.

2. Relevant sections of the NYCBC.

D. All shop and field welding shall be performed by properly trained welders under the immediate supervision of a representative of a standard testing agency or a Special Inspection agency reporting directly to the City of New York. The Contractor shall submit the name of such agency to the City of New York for approval before starting work. The costs of all welding inspections shall be borne by the Contractor.

PART III - EXECUTION

3.1 DRIVING

A. Piles shall be located and driven where shown on the Contract Drawings, unless otherwise directed by the Commissioner. The final driving resistance will be determined based on the specific equipment proposed and the results of driving PDA tested piles or the pile load tests, as specified in the Specifications.

1. Batter piles, if required, shall be driven to the slopes shown on the Contract Drawings. The springing of vertical piles into battered positions will not be permitted.

2. Batter piles shall be driven to a bearing capacity of 25 percent over the bearing capacity for vertical piles.

B. The Contractor shall cooperate with the Special Inspector in determining the resistance to penetration and length of pile and shall mark each pile at one foot intervals before driving or as required by the Special Inspector.

C. Spudding, predrilling, or other methods utilized to maintain alignment or allow easier penetration are subject to the approval of the Commissioner. Jetting will not be permitted. Pre-augering shall be performed to clear existing underground utilities where pile locations are within 2 feet of existing utilities.

D. Piles shall be driven without interruption to the calculated tip elevation to reach a driving resistance in accordance with the test pile or pile load test driving data. The pile hammer used for driving shall be the same type and operated at the same rate and in the same manner as that used for driving the successfully load tested piles.

E. When driving is interrupted before final penetration is reached, the record of penetration shall not be taken until at least a 12-inch penetration has been obtained on resumption of driving.

F. When driving piles in groups or clusters, or under any conditions of relatively close spacing with other new piles, survey reference marks shall be placed on each pile immediately after installation and reference levels recorded. The Contractor shall resurvey the levels of all piles in a group after the group has been driven and while the piles are accessible. Piles heaving or subsiding by more than 1/4 of an inch shall be reported to the Commissioner and re-driven if so directed.

3.2 CUSHION BLOCK AND HAMMER

A. The cushion block used for pile driving shall be a solid block of laminated micarta and steel or aluminum plates. Alternatively, Contractor may use a polymer cushion, such as Nylatron MC 901, or equal. The details of the proposed cushion block shall be submitted for the Commissioner's approval.

B. Pile hammers shall have a sufficient reserve capacity for driving the piles to the design requirements, including any contingencies occurring during driving. The piles shall be driven with a single-acting steam, compressed-air, or hydraulic hammer and the minimum hammer energy and maximum hammer energy in foot-pounds per blow shall be as shown on the Contract Drawings or specified in the Specifications, and in accordance with NYCBC.

3.3 OBSTRUCTIONS

A. When the pile meets obstructions of any kind including concrete, piling, boulders, riprap, rockfill, or timbers within the upper ten (10) feet of driving, the obstructions shall be removed by whatever means necessary including spudding, drilling, augering, and churning. After the removal of the obstructions, the pile shall be redriven to the required penetration. It is essential that the Contractor familiarize himself with the site conditions and the subsurface conditions at the site so as to be prepared for removal of obstructions. If obstructions are encountered below ten (10) feet such as to damage or prevent driving piles, pile shall be abandoned as directed by the Commissioner.

B. The Contractor shall have on hand suitable equipment for spudding through buried timbers, cribbing and similar obstructions, and shall employ this equipment, when directed, in a manner satisfactory to the Commissioner.

C. The actual driven or installed footage of piles abandoned by order of the Commissioner because of obstructions encountered, shall be added to the aggregate pay length of piling. Holes left by withdrawn piles shall be filled with clean granular fill, flowable fill or grout.

D. Piles, which in the opinion of the Special Inspector are so damaged as to destroy their usefulness, shall be removed or abandoned and replaced with new piles.

3.4 TOLERANCES

A. Hammer and piles shall be supported in rigid leads designed to hold the pile firmly in position and in alignment with the hammer.

B. Piles shall not be out of alignment by more than 2 percent of their length. The center of each pile at the level of cutoff shall not vary from its designated center by more than such distance that the stress in any pile group is more than 10 percent greater than its designated stress as determined by the Commissioner.

C. A tolerance of 3 inches from the design location will be permitted in the installation of the piles, without reduction in load capacity, provided that such variation does not produce a load on any pile more than 10 percent greater than its design load bearing capacity as determined by the Commissioner.

3.5 PILE CUTOFF

A. All piles shall be cut off to true planes at the elevation shown on the Contract Drawings.

B. Cutoffs are the property of the Contractor and shall be disposed off-site.

3.6 PILE SURVEY

A. The Contractor shall engage the services of a properly trained surveyor, approved by the Commissioner, for the performance of the survey work. The installed location of each pile shall be established by survey and shown on drawings prepared for this purpose.

B. Copies of the drawings shall be submitted by the Contractor in accordance with the provisions as hereinafter specified in this Article and Article 3.7, Analysis and Corrective Measures. Survey information may be submitted on several drawings, each covering a partial area only, as the job progresses, in order to expedite the approval of the work.

C. Upon completion of all pile installation, the Contractor shall submit to the Commissioner, drawings showing installed location of all piles as related to their center of footings or other reference points and lines, percentage out of plumb, the cutoff elevation, and length below cutoff for each pile. Drawings shall be the same size as the Contract Drawings.

3.7 ANALYSIS AND CORRECTIVE MEASURES

A. The analysis and redesign work called for herein will be performed by the Commissioner.

B. The Commissioner will analyze the conditions at each pile to determine whether corrective measures are required. If corrective measures are not required, approval will be given for proceeding with the work.

C. The Commissioner will determine the corrective measures required to keep pile loads within the allowable limits. Corrective measures, for any piles installed more than 3 inches from the plan location, will be determined by the Commissioner. If the corrective measures are not deemed feasible, the pile shall be abandoned and replaced by another pile installed in a location determined by the Commissioner.

D. If corrective measures involve the installation of additional piles, the Commissioner will prepare supplemental drawings showing the details of the required corrective work.

E. Cost of Additional Work:

1. The cost of installing additional piles (as called for on the supplemental drawings for the corrective measures), shall be borne by the Contractor in the case of rejected, defective, damaged or misdriven piles.

3.8 DAMAGED OR MISPLACED PILES

A. All damaged or misplaced piles shall be removed or abandoned, and new piles shall be driven as directed by the Commissioner at no additional cost to the City of New York. Voids remaining from pulled piles shall be filled with clean granular fill, flowable fill or grout at the Contractor's expense.

B. Abandoned piles shall be cut off one foot below cutoff elevation shown on the Contract Drawings or specified in the Specifications.

C. All damaged piles and cutoff sections shall be removed from the site by the Contractor.

3.9 REJECTED PILES

A. A sudden decrease in driving resistance which cannot be correlated with subsurface data or pile driving event may be a cause for rejection, unless pile is removed for inspection and found to be undamaged.

B. When any pile exceeds the installation tolerances specified in Article 3.4, Tolerances, it may be rejected.

C. When any driven pile has been so injured in driving (due to causes other than obstructions encountered) as to be, in the opinion of the Special Inspector, unsuitable, or otherwise does not conform to the requirements of the Contract Documents, such piles shall be rejected.

D. Rejected piles shall be cut off at an elevation as directed by the Commissioner or removed from the site by the Contractor.

3.10 ADDITIONAL PILES

A. Additional piles shall be installed in locations designated by the Commissioner to replace rejected piles, at no additional cost to the City of New York.

3.11 WITHDRAWN PILES

A. Piles driven in locations, other than in the permanent work, shall be removed, with the approval of the Commissioner, after completion of driving. Such piles, if undamaged, may be reused subject to the approval of the Commissioner.

B. The Contractor shall also remove piles driven in the permanent work for inspection of tips, if so ordered by the Special Inspector.

C. If the Contractor removes any piles driven in the permanent work for the Contractor's convenience, for the prosecution of the work, or for any other reason, except at the direction of the Commissioner, the Contractor shall replace such piles at no additional cost to the City of New York.

D. Where piles are withdrawn, the pile hole shall be backfilled with clean granular fill, flowable fill or grout.

3.12 FOUNDATION PILES

A. All piles, within the area of uniform subsurface conditions pertaining to a given load-tested pile of satisfactory performance, shall be installed to the same or greater penetration resistance (or static load) as the successful load tested pile, and shall bear in or on the same bearing stratum as the load tested pile.

B. The same equipment that was used to install the load tested pile shall be used to install all other piles, and the equipment shall be operated identically.

C. All piles shall be of the same type, shape, external dimension, and equal cross-section as the load tested pile.

3.13 INSPECTION

A. All inspections will be performed by the Special Inspector.

B. The driving of each pile is a mandatory hold point for which 48 hour prior notification of the Commissioner is required, and driving of each pile shall be performed in the presence of the Special Inspector.

C. The Contractor shall cooperate with the Special Inspector in determining the resistance to penetration and shall mark each pile before driving as required by the Special Inspector.

D. The Special Inspector will keep a record of each pile driven. Such record will include the following data:

a. Date of driving
b. Pile number
c. Type and size of pile
d. Type, number, and location of splices
e. Length before driving
f. Length of cut-off
g. Elevation of pile top and tip to nearest 0.1 inch immediately after driving

h. Elevation of pile top after driving entire pile group to the nearest 0.1 inch to determine amount of heave

i. Final elevation of pile tip after required redriving of entire pile group

j. Hammer type and size

k. Hammer speed

l. Blows per foot of driven length, and blows per inch where driving resistance exceeds 24 blows per foot

m. Blows per 1/2 inch of redrive

n. The time pile driving is started, interrupted, resumed and stopped

o. Description of any unusual circumstances affecting the driving of the particular pile

p. Slope of pile

END OF SECTION 31 62 16

SECTION 32 10 10
CONCRETE CURBS

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 work includes but is not limited to the following:
   1. Supply and installation of reinforced concrete curb with steel facing.
   2. Supply and installation of reinforced concrete curbs.
   3. Supply and installation of reinforcing bars and fabric, and expansion joint materials, as shown on the Drawings.

1.3 RELATED WORK

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Asphalt Pavement for Street Restoration: Section 32 12 16

D. Exposed Aggregate Concrete Paving: Section 32 13 16

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Submittals required:
   1. Design mix for concrete pavement material, including proportions of aggregates by weight, slump, water/cement ratio, and percentage of air.
   2. Shop Drawings of Steel Facing.

C. Delivery tickets:
Contractor shall submit one (1) copy of each delivery ticket. Tickets shall be printed, stamped, or written and contain all the information as required by ASTM C94.

1.5 PRODUCT HANDLING

A. Protect aggregates and masonry materials during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

1.6 WEATHER LIMITATIONS

A. No concrete shall be mixed or placed when air temperatures are below 45 deg. F. or above 95 deg. F.

B. Comply with the Recommended Practice for Hot Weather Concreting, ACI 305, and the Recommended Practice for Cold Weather Concreting, ACI 306.

C. Protect masonry materials against freezing when the temperature of the surrounding air is 40 degrees Fahrenheit and falling.
   1. Heat materials and provide temporary protection of completed portions of masonry work.

   2. Comply with the requirements of the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes on Brick and Tile construction by the Brick Institute of America (BIA).

D. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace masonry work damaged by frost or freezing.

PART II - PRODUCTS

2.1 CONCRETE PRODUCTS

A. Cement: Shall be the same brand type and source of supply throughout. Cement shall be Air Entraining Portland cement, conforming to the requirements of ASTM C150, Type II (Moderate Sulfate Resistant).

B. Fine aggregate: Shall be natural sand consisting of clean, hard, durable uncoated particles. Organic content shall be determined according to ASTM C40. Sand shall conform to the requirements and grading of ASTM C33.

C. Coarse aggregate: Shall be crushed stone or crushed washed gravel, free of dirt and organic materials, conforming to the requirements and grading of ASTM C33.

D. Admixtures: Shall be formulated to avoid an increase in water-cement ratio or loss of strength. Submit all proposed admixtures for approval.

E. Water reducing admixture: Shall be used in all concrete and conform to the requirements of ASTM C494.

F. Air entraining agent: Shall conform to the requirements of ASTM C260, and shall be used in all concrete. Total air entrained in freshly mixed concrete shall be 6.0% (+/- 1.5%) of volume of concrete, with required strengths maintained.

G. Water: Shall be from approved source; clean, potable, and free from oils, salt, alkali, or organic matter.

2.2 CONCRETE STRENGTHS AND PROPORTIONS

A. Concrete shall conform to NYC Department of Transportation class B-32, Type II, air entrained, moderate sulphate resistant.

Compressive strength:	3,200 psi minimum at 28 days
Slump:	One and one-half (1 ½") to four (4") inch slump
Aggregate size:	One inch (1") maximum

2.3 CONCRETE ACCESSORIES

A. Reinforcing bars: Shall conform to ASTM A-615, Grade 60

B. Expansion joint filler and sealant materials shall be as manufactured by:
Williams Products Inc, Troy, MI. Telephone (800) 521 9594.
Nomafoam, Zebulon, NC 27597. Telephone (800) 345-7279
Pecora Corp., Harleysville, PA 19438. Telephone (800) 523-6688.
Or Approved Equal.

1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.

2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.

3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.

4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.

5. Sealant colors shall be selected from full range of colors available.

2.4 STEEL FACING

A. Steel facing shall be in accordance with the standard details for steel faced curb-Steel Facing Type D - Bent Plate of the NYC Department of Transportation.

B. Steel facing shall be bent to the radii shown on the Drawings and shall be provided with anchors of the shape and size and attached at such points as shown.

C. Finish:
Steel facing shall receive three coats of paint. Steel surfaces shall be clean and rust free.

1. First Coat (Shop Applied):
   a. Primer shall be alkyd resin, flat finish coating having a dry film thickness of 3 to 4 mils.
   b. Color to be Brown/Red Oxide.
   c. Performance shall meet or exceed the standards of Federal Spec. TT-P-86H, Type III & IV.
   d. Paint requires 16 hours at 77° F before recoating.

2. Second and Third Coats:
   a. Paint to be exterior flat finish, 100% acrylic latex coating having a dry film thickness of 1.3 mils.
   b. Color to be Steel Gray (SW2120).
   c. Paint requires 4 hours at 77° F drying time before recoating.

PART III – EXECUTION

3.1 CONCRETE MIXING

A. Concrete shall be ready-mixed in conformance with the requirements of ASTM C94 for measurement of materials, batching, mixing, mixing, and delivery, and shall be discharged with 90 minutes after mixing.

1. Additional water may be initially added at the site to increase the slump, providing neither the maximum allowable slump nor w/c ratio are exceeded.

2. Concrete which subsequently loses slump to the extent that it cannot be properly deposited and consolidated shall not be used.

3. Mixing and conveying equipment shall be thoroughly clean and free from hardened concrete and foreign materials before concrete operation is started.

4. Mixer shall produce a thoroughly mixed, uniform mass, and discharge the mixture without segregation.

5. Entire batch shall be discharged before the mixer is recharged.

3.2 CONCRETE CURB INSTALLATION

A. Curb shall be constructed in independent sections and shall have smooth plane ends separated by expansion joints.
   1. Steel bar reinforcement between expansion joints shall be secured to chairs of the proper height to hold them in position while concrete is poured.
   2. Distance between supporting chairs shall not exceed five feet.
   3. Reinforcing bars shall not extend through expansion joints.

B. All forms shall be set true to line and grade and held rigidly in position. Forms shall be metal or planed lumber of sufficient thickness to resist distortion, support the front face of the curb, and be rigidly held in position during construction.
   1. Forms shall provide a smooth surface at the curb face.
   2. After the forms are erected and reinforcing steel is set in place, all contact surfaces within forms shall be moistened.

C. Concrete shall be placed in horizontal layers of uniform thickness, with each layer thoroughly consolidated before placement of the next layer. Thickness of each layer shall not exceed eighteen (18") inches.

D. Stiff concrete mixes (low slump) shall be consolidated either by hand tools or by mechanical vibrators. The concrete shall be worked thoroughly around the reinforcement.

E. Exposed concrete surfaces shall have smooth float finish. Surfaces shall be finished smooth and true by means of wooden or steel floats.
   1. All edges shall be rounded or chamfered.

F. Forms shall be left in place for a minimum of three (3) days or until the concrete has set sufficiently so that they can be removed without damage to the curbing.
   1. The curbing shall immediately upon removal of the forms be wetted and rubbed down to a smooth and uniform surface by means of carborundum or other abrasive blocks.
   2. For this work, a competent and skilled finisher shall be employed.

G. Where fence or railing posts are to be erected in concrete curb, sleeves shall be installed in the correct location, as shown on the Drawings. Sleeves shall be structurally rigid, cut to the required lengths and firmly set in the form in a vertical position.

3.3 STEEL-FACED CURB INSTALLATION

A. Tolerances:
   1. Final top elevation shall not vary more than 1/4 inch from elevations shown on the Drawings.
   2. Grades shall be smooth between high points and low points indicated, with no

variation greater than 1/4 inch.

B. The steel facing shall be set on a concrete curb foundation and backed with concrete for a width of eight (8) inches from the face of the steel, as shown on the Drawings.

C. The steel facing shall be placed within forms, upon suitable chairs to the proper line and grade. Forms shall be metal or planed lumber of sufficient thickness to resist distortion, support the front face of the steel curb, and be rigidly held in position during construction.

D. Steel facing shall be placed in sections of equal length, with expansion joints at a maximum of 25 feet on center.

E. The concrete shall be poured into forms behind the steel facing. It shall be worked around the anchors of the steel facing to insure satisfactory bond. The top of concrete shall be finished by trowelling and wood floating.

F. The concrete shall be carefully protected against injury from rain, frost, the drying effects of sun and wind, traffic or other causes by means of suitable guards and covering and shall be kept moist as required.

G. Top surface of concrete curb shall have smooth float finish. Surfaces shall be finished smooth and true by means of wooden or steel floats.

3.4 EXPANSION JOINTS

A. Expansion joints shall be installed at a maximum of 25 feet on center along length of curb and between new concrete curbs and all adjacent rigid pavements, walls, curbs, buildings or other structures.

B. Hold reinforcing materials a minimum of three (3) inches clear from all expansion joints.

C. The surface of the concrete at all expansion joints shall be thoroughly cleaned prior to placing adjoining concrete.

D. At expansion joints the joints shall be clean and dry and the joint filler material secured in place prior to the placing of fresh concrete.

1. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.

2. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.

3. Sealant shall be flush with finished surface of concrete.

3.5 CONCRETE CURING & PROTECTION

A. Concrete shall be carefully protected from the drying effects of the sun and wind, traffic,

or other causes by means of suitable guards and covering, and shall be kept moist for a period of three (3) days.

B. Concrete shall be protected against imprints or marking during the curing period. Any imperfections which occur before the concrete has set shall be repaired by the Contractor prior to final acceptance, at no additional cost to the Owner.

3.6 INSPECTION

A. Finished surface shall be smooth, uniform and solid, with no chipping or cracking.

B. Repairs:

1. Cut out and remove all defective areas, or areas which do not meet specified tolerances, and replace with new concrete or steel facing installed in conformance with these specifications.

2. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.7 CLEAN-UP

A. Upon completion of curb installations, the Contractor shall remove all equipment, excess materials, and debris from the site. All damaged areas shall be restored and the area shall be left in a clean state acceptable to the Commissioner.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 32 12 16
ASPHALT PAVEMENT FOR STREET RESTORATION

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of asphalt pavements and base courses.
   2. Saw-cutting, excavation and removal of existing pavements as necessary to install new curbs, walls and sidewalks at existing streets.
   3. Preparation of subgrades as by this Section, and supply and installation of broken stone base course.

1.3 RELATED WORK

A. Demolition: Section 02 41 00

B. Excavation – Earth and Rock: Section 31 23 16

C. Backfilling: Section 31 23 23

D. Concrete Curb: Section 32 10 10

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Submittals required:
   1. Design mix for asphalt binder course and asphalt wearing course.
   2. Mechanical sieve analysis for crushed stone base course material

C. Tests of materials shall be made in accordance with the latest specifications of the American Society for Testing and Materials.

1.5 REFERENCES

A. New York State Department of Transportation (NYSDOT) Standard Specifications

B. New York City Department of Transportation (NYCDOT), Bureau of Highway Operations Standard Specifications

1.6 DELIVERY, STORAGE & HANDLING

A. Protect aggregates during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

B. Shipments of material shall be made in vehicles previously cleaned of all foreign material, and delivered to the work, so that it will not become contaminated in any way.

1.7 ENVIRONMENTAL CONDITIONS

A. Cold Weather Protection:
Comply with the following requirements:

1. No asphalt shall be mixed or placed when air temperatures are below 45° F or above 95° F.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen subgrade or setting beds.
4. Remove and replace work damaged by frost or freezing.

PART II - PRODUCTS

2.1 BROKEN STONE BASE COURSE

A. Broken stone shall conform to the following gradations, equal to New York State DOT Type 4 base course, conforming to the following gradations:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1/4"	30 - 60
#40	5 - 40
#200	0 - 10

2.2 ASPHALT – GENERAL

A. The following requirements shall apply for both Binder Course and Top Course:

1. Asphalt Cement shall be 100% soluble in Trichloroethylene.
2. The mixing and placing temperature shall be 250 degrees to 325 degrees F.

3. The viscosity of the asphalt shall be AC 20.
4. The mix shall have a minimum Marshall Stability of 500 lbs
5. The mix shall have a flow of 8 to 16,
6. The mix shall have a percent of air voids 3 to 5 percent.

B. The asphalt mix may contain a maximum of 15% by weight of Recycled Asphalt Pavement (R.A.P.) material. R.A.P. shall comply with NYS DOT Standard Specifications, Section 703-09 "Reclaimed Asphalt".

1. The R.A.P. shall be certified by the inspection service before use and shall be free of dirt, debris, garbage, metal, glass and any other deleterious material.

2. The City of New York reserves the right to reject the R.A.P. asphalt mix if in the determination of the Commissioner, the mix is contaminated with dirt, debris, garbage, metal, or glass. R.A.P. is not acceptable for the top courses of asphalt pavement for tennis courts.

3. R.A.P. shall be tested by an approved laboratory for (%) percent asphalt cement before mixing.

2.3 BINDER COURSE

A. The material for the binder course shall meet the requirements of the latest edition of the NYS DOT Standard Specification Section 400 "Bituminous Pavements".

B. Composition of the asphalt concrete binder shall be Type 3 as indicated in the following table:

SCREEN SIZE	PERCENTAGE PASSING	
1 1/2"	100	
1"	95 - 100	
1/2"	70 - 90	+/-6
1/4"	48 - 74	+/-7
1/8"	32 - 62	+/-7
No. 20	15 - 39	+/-7
No. 40	8 - 27	+/-7
No. 80	4 - 16	+/-4
No. 200	2 - 8	+/-2
Asphalt Content	4.5 - 6.5	+/-0.4

2.4 TOP COURSE

A. The material for the top course shall meet the requirements of the latest edition of the NYS DOT Standard Specifications Section 400 "Bituminous Pavements".

B. Composition of the asphalt concrete top course shall be Type 6F as indicated in the following table:

SCREEN SIZE	PERCENTAGE PASSING	
1"	100	
1/2"	95 - 100	
1/4"	65 - 85	+/-7
1/8"	36 - 65	+/-7
No. 20	15 - 39	+/-7
No. 40	8 - 27	+/-7
No. 80	4 - 16	+/-4
No. 200	2 - 6	+/-2
Asphalt Content	5.4 – 7.0	

2.5 TACK COAT

A. Tack coat shall consist of asphalt emulsion, NYSDOT Standard Specifications, material designation 702-90

2.6 FORMWORK

A. Forms shall be of wood or steel, minimum length of ten feet (10'). All forms shall be straight, free from bends and warps at all times.

PART III - EXECUTION

3.1 PREPARATION

A. Saw-cutting:
Saw cut existing street at limit of new pavement work as needed for installation of new curbs and walls.

1. Saw-cutting shall be carried out to the full depth of the pavement, to accurate straight lines.

2. Saw cutting shall be done with power saws specifically designed and manufactured for such a purpose.

3. Workmen shall wear safety clothing and eye protection while operating saw equipment and shall be thoroughly familiar in the safe operation of the equipment.

B. Excavation

1. Excavate to depths required for installation of new pavement. Remove top soil, boulders, muck, soft clay, spongy material and any other objectionable material

to a minimum depth of 24 inches below final finished grade and backfill with broken stone, sand and gravel or other approved fill to promote positive drainage.

2. The subgrade shall be compacted with equipment that will yield the following density:
Cohesive Subgrade - Minimum of 95% of AASHO T 180 Method D density
Cohesionless Subgrade - Minimum 100% of AASHO T 180 Method D density

3.2 ASPHALT PAVEMENT - GENERAL

A. Asphaltic concrete pavement shall consist of the following layers:
1. 12 inch thick broken stone base course
2. Asphalt emulsion tack coat
3. 6 inch thick binder course of asphaltic concrete
4. Asphalt emulsion tack coat
5. 2 inch thick top course of fine surface mix asphaltic concrete

3.3 FORMWORK

A. Forms shall be cleaned thoroughly and oiled before pavement is placed against them; this cleaning and oiling being repeated daily as the forms are moved ahead.

B. The forms shall rest firmly upon the thoroughly compacted sub-grade throughout their entire length, shall be joined neatly and tightly and staked securely to line and grade in advance of the point of placing pavement by using at least three (3) bracing pins or stakes to each ten foot (10') length of side form, so that they will resist the pressure of the pavement and the impact of the roller without springing.

3.4 BASE COURSE

A. Install base course material and compact the broken stone base to reach thickness shown on drawings and to meet 95% maximum dry density.

B. Compaction shall be accomplished by rolling, except in the areas inaccessible to rollers, equivalent compaction shall be accomplished by the use of mechanical tampers, until there is no further evidence of consolation and all roller marks are eliminated.

C. Depressions or high areas which develop during rolling shall be corrected to produce a surface with no variations greater than 1/8" over a ten foot length.

3.5 ASPHALT INSTALLATION

A. Tack Coat:
Before spreading any asphalt mixes, spray the compacted base course aggregate with asphalt emulsion tack coat in the amount of 0.25 gallon per square yard.

1. Tack coat shall be applied evenly by means of a truck having appropriate spray nozzles.

2. All nozzles shall be kept free of clogs.

3. Paint contact surfaces of all curbing, gutters, manholes and adjacent pavement edges with the tack coat material.

4. Tack coat shall not be applied on a wet pavement surface or when the temperature is below 45°F.

5. Allow the tack coat to cure until sticky or tacky.

6. Renew and repair or replace damaged coating.

B. Formwork:
Provide formwork as needed. In all cases adequately support the sides of roadways until final compaction has been obtained and the mixture has hardened by cooling.

C. Binder Course:
Plant-Mixed binder course shall be furnished and laid by means of a mechanical spreader to a depth which after final compaction shall be equal to the specified depth.

1. In areas where the use of a mechanical spreader is impractical, as determined by the Commissioner, other approved means of spreading and compacting may be permitted.

2. The use of hand rakes will not be permitted. The Contractor shall use lutes where necessary.

D. Rolling and Compacting:

1. Roll and compact the asphalt concrete binder course with one or more power-driven rollers weighing not less than ten (10) tons. Rolling shall proceed continuously not in excess of the following rates:

Method of Placement	Square Yards/Hour/Roller
Hand	800
Machine	1200

2. After final compaction, the binder course shall have a density of not less than 95% percent of the theoretical maximum density as calculated in accordance with Appendix B of the Asphalt Institute Manual, MS-2.

3. After the compaction of the binder course and before the placing of the top course, the binder course shall be checked for depressions. The Contractor shall check the entire area using a ten foot (10') wood or metal straight-edge. Any depression greater than one-eighth inch (1/8") shall be corrected before the placing of the top course.

E. Top Course - Preparation:
Before spreading the top course, spray the binder course with asphalt emulsion tack coat as described above.

1. Apply a tack coat at a rate of 0.03 to 0.07 gallon per square yard.

2. Thoroughly clean the binder course of all loose and foreign material before the top mixture is delivered.

3. Weather Limitations: Bituminous material or mixture shall not be applied on any soft surfaces, when the surface is wet, when the temperature of the surface on which the mixture is to be placed is below 45°F, or when other weather conditions would prevent proper construction of the pavement.

4. If weather conditions necessitate delaying the installation of the wearing course for more than two days, the tack coat shall be reapplied to the binder course at the rate of 0.03 to 0.07 gallon per square yard.

F. Top Course - Spreading and Compacting:
Spread and compact the wearing course until it meets the compaction and surface requirements specified above for the binder course.

1. The Contractor shall have the same options for achieving the required compaction as given for the compaction of the binder course.

2. Do not lay over 500 lineal feet of wearing course material without it being rolled and properly compacted.

3. Do not use mixture which has been over 45 minutes out of the mixer, or if longer, the mixture must be over 250°F when spread.

G. Joints:
Perform construction as near continuously as possible. Carefully make joints between old and new pavements, or between successive days work, in a manner which will insure a thorough and continuous bond, as follows:

1. Cut back the edge of the old surface before recommencing the operation of laying, in order to present a fresh, clean surface for contact with the newly placed material.

2. Carefully employ hot smoothing irons to heat the old pavement sufficiently (without burning) to insure a proper bond.

3.6 PROTECTION

A. After paving, clear surfaces of excess asphaltic concrete and all foreign matter. Protect new pavement until fully hardened. Cover openings of drainage structures until permanent covers are placed.

3.7 INSPECTION

A. Finished surface shall be smooth, uniform and solid, with no depressions.

B. Repairs: Remove and replace defective areas. Cut such areas and replace with fresh asphaltic concrete and compact to required density.
   1. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.8 CLEAN-UP

A. Upon completion of all paving installation, the Contractor shall remove all equipment, excess materials, and debris from the site. All damaged areas shall be restored and the area shall be left in a clean state acceptable to the Commissioner.

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of reinforced concrete pavement.
   2. Supply and installation of crushed stone base course.
   3. Supply and installation of reinforcing bars and fabric, and expansion joint materials, as shown on the drawings.

1.3 RELATED WORK

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Design mix for concrete pavement material, including proportions of aggregates by weight, slump, water/cement ratio, and percentage of air.

C. Mechanical sieve analysis for crushed stone base course material.

D. Samples - Sealant:
Sample submittals will be reviewed for color only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

E. Delivery tickets:
Contractor shall submit one (1) copy of each delivery ticket. Tickets shall be printed, stamped, or written and contain all the information as required by ASTM C94.

1.5 PRODUCT HANDLING

A. Protect aggregates and masonry materials during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

1.6 WEATHER LIMITATIONS

A. No concrete shall be mixed or placed when air temperatures are below 45 deg. F. or above 95 deg. F.

B. Comply with the Recommended Practice for Hot Weather Concreting, ACI 305, and the Recommended Practice for Cold Weather Concreting, ACI 306.

C. Protect masonry materials against freezing when the temperature of the surrounding air is 40 degrees Fahrenheit and falling.
   1. Heat materials and provide temporary protection of completed portions of masonry work.

   2. Comply with the requirements of the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes on Brick and Tile construction by the Brick Institute of America (BIA).

D. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace masonry work damaged by frost or freezing.

PART II - PRODUCTS

2.1 CONCRETE PRODUCTS

A. Cement: Shall be the same brand type and source of supply throughout. Cement shall be Portland cement, conforming to the requirements of ASTM C150, Type II (Moderate Sulfate Resistant).

B. Fine aggregate: Shall be natural sand consisting of clean, hard, durable uncoated particles. Organic content shall be determined according to ASTM C40. Sand shall conform to the requirements of ASTM C33.

C. Coarse aggregate: Shall be crushed stone or crushed washed gravel from approved source, free of dirt and organic materials, conforming to the requirements of ASTM C33.

D. Admixtures: Shall be formulated to avoid an increase in water-cement ratio or loss of strength. Submit all proposed admixtures for approval.

E. Water reducing admixture: Shall be used in all concrete and conform to the requirements

of ASTM C494.

F. Air entraining agent: Shall conform to the requirements of ASTM C260, and shall be used in all concrete. Total air entrained in freshly mixed concrete shall be 6.0% +/- 1.5% of volume of concrete, with required strengths maintained.

G. Water: Shall be from approved source; clean, potable, and free from oils, salt, alkali, or organic matter.

2.2 CONCRETE STRENGTHS AND PROPORTIONS

A. Concrete shall conform to NYC Department of Transportation class B-32, Type II, air entrained, moderate sulphate resistant.

Compressive strength:	3,200 psi minimum at 28 days
Slump:	One and one-half (1 ½") to four (4") inch slump
Aggregate size:	3/4" maximum.

B. Mix proportions shall be selected to produce an average strength exceeding f'c in accordance with the provision of ACI 318, Section 4.2.

C. Mix proportions shall be determined in accordance with either Method 1 or Method 2 as described in ACI 301.

D. If it is intended to place any concrete by pumping, a corresponding mix shall be designed for such placement and so designated.

2.3 CONCRETE ACCESSORIES

A. Reinforcing bars: Shall conform to ASTM A-615, Grade 60

B. Welded wire fabric: Shall conform to ASTM A-82 and A-185. Splicing shall conform to the requirements of ACI 318.

C. Expansion joint filler and sealer materials shall be as manufactured by:
Williams Products Inc, Troy, MI. Telephone (800) 521 9594.
Nomafoam, Zebulon, NC 27597. Telephone (800) 345-7279
Pecora Corp., Harleysville, PA 19438. Telephone (800) 523-6688
Or Approved Equal.

1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.

2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.

3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber

sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.

4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.

5. Sealant colors shall be selected by Commissioner from full range of colors available.

2.4 CRUSHED STONE BASE COURSE

A. Crushed stone shall conform to the following gradations, equal to NYS DOT Type 4 base course:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1/4"	30 - 60
#40	5 - 40
#200	0 - 10

PART III – EXECUTION

3.1 CONCRETE MIXING

A. Concrete shall be ready-mixed in conformance with the requirements of ASTM C94 for measurement of materials, batching, mixing, mixing, and delivery, and shall be discharged with 90 minutes after mixing.

1. Additional water may be initially added at the site to increase the slump, providing neither the maximum allowable slump nor w/c ratio are exceeded.

2. Concrete which subsequently loses slump to the extent that it cannot be properly deposited and consolidated shall not be used.

3. Mixing and conveying equipment shall be thoroughly clean and free from hardened concrete and foreign materials before concrete operation is started.

4. Mixer shall produce a thoroughly mixed, uniform mass, and discharge the mixture without segregation.

5. Entire batch shall be discharged before the mixer is recharged.

3.2 BASE PREPARATION

A. Preparation:

1. The excavation shall be completely cleared of all debris and undesirable material.

2. The excavation shall not be muddy, waterlogged, or otherwise unsatisfactory

when the crushed stone or concrete is placed upon it.

3. If the excavation becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.

4. Fine-grade all areas to receive concrete and compact with a self-propelling roller weighing not less than ten (10) tons.

5. All hollows and depressions which develop under rolling shall be filled with clean soil fill conforming to Section 312323: Backfilling.

6. Install crushed stone base course material on the prepared excavation in the position shown on the Drawings, in four inch (4") layers, each layer to be rolled while wet with a seven (7) to twelve (12) ton tandem roller to the thickness shown on the Drawings.

7. Base course shall be wetted immediately before concrete is placed.

3.3 CONCRETE PAVEMENT INSTALLATION

A. Tolerances:
1. Final thickness of concrete shall not vary more than 1/4 inch from dimensions shown on the drawings.

2. Final grade shall not vary more than 1/2 inch from elevations shown on the drawings.

3. Grades shall be smooth between high points and low points indicated, graded for positive drainage, with no variation greater than 1/4 inch.

B. Dewatering:
All concrete shall be placed in-the-dry. To this end drainage and dewatering of excavations may be required.
1. The presence of ground water in excavations will not constitute a condition for which an increase in the contract price may be made.

2. Pumping associated with dewatering shall be discharged through hay bale filters to existing storm drain inlets as approved by the Engineer. Cost of hay bale filters shall be included in the work of this Section.

C. Reinforcing:
All formwork and reinforcing shall be inspected and approved by the Commissioner prior to the placement of any concrete.

D. Depositing:
All concrete shall be deposited in accordance with ACI 304.
1. Concrete shall be conveyed from the mixer to the place of final deposit in a

practically continuous flow by methods which will prevent the separation or loss of the ingredients.

2. Use of chutes longer than 10 feet must be approved before use by Engineer.

3. Concrete may be pumped. Use of aluminum alloys in the pumping train is prohibited.

4. Concrete shall be placed in the forms or on grade as nearly as practicable to its final position and shall be thoroughly vibrated around all reinforcing bars and mesh to assure complete absence of voids.

5. Under no circumstances shall partially hardened concrete be placed in the work.

E. Finish:
The top surfaces shall be finished to true smooth planes by trowelling. After initial trowelling surfaces shall be finished to a smooth uniform finish with wood floats.

3.4 CONCRETE PAVEMENT JOINTS

A. Expansion joints:
1. At concrete slabs, concrete shall be divided into panels containing a maximum of 400 square feet or as shown on the drawings. Each panel shall be separated by expansion joints.

2. Expansion joints shall be installed between new concrete pavements and all existing rigid pavements, walls, curbs, buildings or other structures.

3. Hold reinforcing materials a minimum of three (3) inches clear from all expansion joints.

4. The surface of the concrete at all expansion joints shall be thoroughly cleaned prior to placing adjoining concrete.

B. At expansion joints the joints shall be clean and dry and the joint filler material secured in place prior to the placing of fresh concrete.
1. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.

2. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.

3. Sealant shall be flush with finished surface of concrete.

C. Score joints:
Within each panel, concrete shall be divided by scored control joints, located at a maximum of five (5) feet on center, or as shown on the drawings. Joint shall be tooled as

shown on the drawings.

3.5 CONCRETE CURING & PROTECTION

A. Concrete shall be carefully protected from the drying effects of the sun and wind, traffic, or other causes by means of suitable guards and covering, and shall be kept moist for a period of three (3) days.

B. Concrete shall be protected against imprints or marking during the curing period. Any imperfections which occur before the concrete has set shall be repaired by the Contractor prior to final acceptance, at no additional cost to the City of New York.

3.6 INSPECTION

A. Finished surface shall be smooth, uniform and solid, with no chipping or cracking.

B. Repairs:

1. Cut out and remove all defective areas, or areas which do not meet specified tolerances, and replace with new concrete installed in conformance with these specifications.

2. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.7 CLEAN-UP

A. Upon completion of all paving installation, the Contractor shall remove all equipment, excess materials, and debris from the site. All damaged areas shall be restored and the area shall be left in a clean state acceptable to the Engineer.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 32 13 16
EXPOSED AGGREGATE CONCRETE PAVING

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of reinforced exposed aggregate concrete pavement.
   2. Supply and installation of crushed stone base course.
   3. Supply and installation of reinforcing bars and fabric, and expansion joint materials, as shown on the drawings.

1.3 RELATED WORK

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Concrete Curb: Section 32 10 10

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Design mix for concrete pavement material, including proportions of aggregates by weight, slump, water/cement ratio, and percentage of air.

C. Mechanical sieve analysis for crushed stone base course material.

D. Samples – Stone Aggregate for exposed aggregate finish:
Samples will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

E. Samples - Sealant:
Sample submittals will be reviewed for color only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

F. Mock-ups of exposed aggregate finish:
1. 5' x 5' panel of showing pavement color and finish, including 5' length score joint.

2. Construct using processes and techniques intended for use on permanent work, including curing procedures.

G. Delivery tickets:
Contractor shall submit one (1) copy of each delivery ticket. Tickets shall be printed, stamped, or written and contain all the information as required by ASTM C94.

1.5 PRODUCT HANDLING

A. Protect aggregates and masonry materials during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

1.6 WEATHER LIMITATIONS

A. No concrete shall be mixed or placed when air temperatures are below 45 deg. F. or above 95 deg. F.

B. Comply with the Recommended Practice for Hot Weather Concreting, ACI 305, and the Recommended Practice for Cold Weather Concreting, ACI 306.

C. Protect masonry materials against freezing when the temperature of the surrounding air is 40 degrees Fahrenheit and falling.
1. Heat materials and provide temporary protection of completed portions of masonry work.

2. Comply with the requirements of the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes on Brick and Tile construction by the Brick Institute of America (BIA).

D. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace masonry work damaged by frost or freezing.

PART II - PRODUCTS

2.1 CONCRETE PRODUCTS

A. Cement: Shall be the same brand type and source of supply throughout. Cement shall be Portland cement, conforming to the requirements of ASTM C150, Type II (Moderate Sulfate Resistant).

B. Fine aggregate: Shall be natural sand consisting of clean, hard, durable uncoated particles. Organic content shall be determined according to ASTM C40. Sand shall conform to the requirements of ASTM C33.

C. Coarse aggregate: Shall be crushed stone or crushed washed gravel from approved source, free of dirt and organic materials, conforming to the requirements of ASTM C33.

D. Admixtures: Shall be formulated to avoid an increase in water-cement ratio or loss of strength. Submit all proposed admixtures for approval.

E. Water reducing admixture: Shall be used in all concrete and conform to the requirements of ASTM C494.

F. Air entraining agent: Shall conform to the requirements of ASTM C260, and shall be used in all concrete. Total air entrained in freshly mixed concrete shall be 6.0% =/- 1.5% of volume of concrete, with required strengths maintained.

G. Water: Shall be from approved source; clean, potable, and free from oils, salt, alkali, or organic matter.

2.2 CONCRETE STRENGTHS AND PROPORTIONS

A. Concrete shall conform to NYC Department of Transportation class B-32, Type II, air entrained, moderate sulphate resistant.

Compressive strength:	3,200 psi minimum at 28 days
Slump:	One and one-half (1 ½") to four (4") inch slump
Aggregate size:	3/4" maximum.

B. Mix proportions shall be selected to produce an average strength exceeding f'c in accordance with the provision of ACI 318, Section 4.2.

C. Mix proportions shall be determined in accordance with either Method 1 or Method 2 as described in ACI 301.

D. If it is intended to place any concrete by pumping, a corresponding mix shall be designed for such placement and so designated.

2.3 CONCRETE ACCESSORIES

A. Reinforcing bars: Shall conform to ASTM A-615, Grade 60

B. Welded wire fabric: Shall conform to ASTM A-82 and A-185. Splicing shall conform to the requirements of ACI 318.

C. Expansion joint filler and sealer materials shall be as manufactured by:
Williams Products Inc, Troy, MI. Telephone (800) 521 9594.
Nomafoam, Zebulon, NC 27597. Telephone (800) 345-7279
Pecora Corp., Harleysville, PA 19438. Telephone (800) 523-6688
Or Approved Equal.

1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.

2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.

3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.

4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.

5. Sealant colors shall be selected by Commissioner from full range of colors available.

2.4 CRUSHED STONE BASE COURSE

A. Crushed stone shall conform to the following gradations, equal to NYS DOT Type 4 subbase course:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1/4"	30 - 60
#40	5 - 40
#200	0 - 10

PART III – EXECUTION

3.1 CONCRETE MIXING

A. Concrete shall be ready-mixed in conformance with the requirements of ASTM C94 for measurement of materials, batching, mixing, mixing, and delivery, and shall be discharged with 90 minutes after mixing.

1. Additional water may be initially added at the site to increase the slump, providing neither the maximum allowable slump nor w/c ratio are exceeded.

2. Concrete which subsequently loses slump to the extent that it cannot be properly

deposited and consolidated shall not be used.

3. Mixing and conveying equipment shall be thoroughly clean and free from hardened concrete and foreign materials before concrete operation is started.

4. Mixer shall produce a thoroughly mixed, uniform mass, and discharge the mixture without segregation.

5. Entire batch shall be discharged before the mixer is recharged.

3.2 BASE PREPARATION

A. Preparation:

1. The excavation shall be completely cleared of all debris and undesirable material.

2. The excavation shall not be muddy, waterlogged, or otherwise unsatisfactory when the crushed stone or concrete is placed upon it.

3. If the excavation becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.

4. Fine-grade all areas to receive concrete and compact with a self-propelling roller weighing not less than ten (10) tons.

5. All hollows and depressions which develop under rolling shall be filled with clean soil fill conforming to Section 312323: Backfilling.

6. Install crushed stone base course material on the prepared excavation in the position shown on the Drawings, in four inch (4") layers, each layer to be rolled while wet with a seven (7) to twelve (12) ton tandem roller to the thickness shown on the Drawings.

7. Base course shall be wetted immediately before concrete is placed.

3.3 CONCRETE PAVEMENT INSTALLATION

A. Tolerances:

1. Final thickness of concrete shall not vary more than 1/4 inch from dimensions shown on the drawings.

2. Final grade shall not vary more than 1/2 inch from elevations shown on the drawings.

3. Grades shall be smooth between high points and low points indicated, graded for positive drainage, with no variation greater than 1/4 inch.

B. Dewatering:
All concrete shall be placed in-the-dry. To this end drainage and dewatering of excavations may be required.

1. The presence of ground water in excavations will not constitute a condition for which an increase in the contract price may be made.

2. Pumping associated with dewatering shall be discharged through hay bale filters to existing storm drain inlets. Cost of hay bale filters shall be included in the work of this Section.

C. Reinforcing:
All formwork and reinforcing shall be inspected and approved by the Commissioner prior to the placement of any concrete.

D. Depositing:
All concrete shall be deposited in accordance with ACI 304.

1. Concrete shall be conveyed from the mixer to the place of final deposit in a practically continuous flow by methods which will prevent the separation or loss of the ingredients.

2. Use of chutes longer than 10 feet must be approved before use by Commissioner.

3. Concrete may be pumped. Use of aluminum alloys in the pumping train is prohibited.

4. Concrete shall be placed in the forms or on grade as nearly as practicable to its final position and shall be thoroughly vibrated around all reinforcing bars and mesh to assure complete absence of voids.

5. Under no circumstances shall partially hardened concrete be placed in the work.

E. Float Finish:
Surfaces shall be finished uniformly with wood float finish. Work float flat on surface using pressure in swirling manner to produce series of uniform arcs and twists.

3.4 EXPOSED AGGREGATE FINISHING

A. Exposed aggregate may be either seeded type or monolithic type. Aggregates to be used shall be selected from a full range of material types and colors meeting product specifications.

B. Begin initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

C. Exposed aggregate shall be provided by one of the following methods as determined by

sample review and mock-up approval process:

1. Monolithic Exposed-Aggregate Finish:
   Expose coarse aggregate in pavement surfaces as follows:

   a. Immediately after float finishing, spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.

   b. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.

   c. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon-bristle broom.

   d. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.

2. Seeded Exposed Aggregate Finish:
   Immediately after initial floating, spread a single layer of aggregate uniformly on pavement surface. Tamp aggregate into plastic concrete, and float finish to entirely embed aggregate with mortar cover of 1/16th inch. Proceed with steps a-d described above.

3.5 CONCRETE PAVEMENT JOINTS

A. Expansion joints:
   1. At concrete slabs, concrete shall be divided into panels containing a maximum of 400 square feet or as shown on the drawings. Each panel shall be separated by expansion joints.

   2. Expansion joints shall be installed between new concrete pavements and all existing rigid pavements, walls, curbs, buildings or other structures.

   3. Hold reinforcing materials a minimum of three (3) inches clear from all expansion joints.

   4. The surface of the concrete at all expansion joints shall be thoroughly cleaned prior to placing adjoining concrete.

B. At expansion joints the joints shall be clean and dry and the joint filler material secured in place prior to the placing of fresh concrete.
   1. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.

   2. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.

3. Sealant shall be flush with finished surface of concrete.

C. Score joints:
Within each panel, concrete shall be divided by scored control joints, located at a maximum of five (5) feet on center, or as shown on the drawings. Joint shall be tooled as shown on the drawings.

3.6 CONCRETE CURING & PROTECTION

A. Concrete shall be carefully protected from the drying effects of the sun and wind, traffic, or other causes by means of suitable guards and covering, and shall be kept moist for a period of three (3) days.

B. Concrete shall be protected against imprints or marking during the curing period. Any imperfections which occur before the concrete has set shall be repaired by the Contractor prior to final acceptance, at no additional cost to the Commissioner.

3.7 INSPECTION

A. Finished surface shall be smooth, uniform and solid, with no chipping or cracking.

B. Repairs:
1. Cut out and remove all defective areas, or areas which do not meet specified tolerances, and replace with new concrete installed in conformance with these specifications.

2. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.8 CLEAN-UP

A. Upon completion of all paving installation, the Contractor shall remove all equipment, excess materials, and debris from the site. All damaged areas shall be restored and the area shall be left in a clean state acceptable to the Commissioner.

END OF SECTION

SECTION 32 14 10
STABILIZED GRAVEL PAVING

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of stabilized gravel paving.
   2. Supply and installation of select fill base course.
   3. Supply and installation of edgings and all incidentals required for stabilized gravel paving.
   4. Works shall include new areas of stabilized gravel paving and repair of all existing areas of stabilized gravel paving damaged by construction operations of this Contract.

1.3 RELATED ITEMS

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Stone Paving: Section 32 14 20

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data:
Submit manufacturer's technical information for the following items:
   1. Binder material.
   2. Steel edging.

C. Samples:
Submit samples, showing the full range of colors, for the following items:
   1. Gravel paving top course material: One (1) pound bag.

D. Test Results:
Submit sieve analysis test results for the following items:
1. Gravel top course material.

2. Select fill base course material.

1.5 FIELD CONSTRUCTED MOCK-UPS

A. After approval of all required submittals as specified herein, prepare in-place mock-up of Stabilized Gravel Paving at the project site, in approved location.
1. Mock-up shall consist of one section of stabilized gravel paving, approximately 10'-0" x 10'-0".

2. Approved mock-up section may become part of the final work.

3. Make any changes required until mock-up is approved.

4. Do not proceed with installation of Stabilized Gravel Paving until written approval of mock-ups is obtained.

B. The purpose of the mock-up is to verify the understanding of the specified procedures by the Contractor, and to establish the standards of quality and workmanship in the completed work.

1.6 PRODUCT HANDLING

A. Deliver masonry materials to project site in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

B. Store cementitious materials off the ground, under cover and in a dry location.

C. Protect all masonry materials and aggregates during storage and construction against wetting by rain, snow or ground water and against intermixture with earth or other types of materials.

1.7 WEATHER LIMITATIONS

A. No paving shall be installed when temperatures are at or below 40 degrees F., or during rain, sleet, or snow.

B. Do not install top course just prior to, or immediately following rain or snow fall.

C. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen or thawing subgrade or base course. Remove and replace work damaged by frost or freezing.

PART II - PRODUCTS

2.1 SELECT FILL

A. Select Fill base course material shall comply with the requirements of Backfilling: Section 312323.

2.2 GRAVEL TOP COURSE

A. Gravel top course material shall consist of one-quarter inch (1/4") size stone screenings with clean, hard, durable, sharp edged stone fragments. Material shall be free from dirt, clay, lumps, organic or other deleterious material. Fines shall be evenly mixed throughout the aggregate.

B. Aggregate shall be supplied by:
1. George Scofield, Bound Brook, NJ 08805. Phone 908-356-0858.
2. Ferrara Brothers Redimix, Flushing, NY 11354. Phone 718-939-3030.
3. Tilcon New York Inc., West Nyack, NY 10994. Phone 800-TRAPROC
4. Or approved equal.

C. Color of gravel to be a blend:
50% Plymouth Brown
50% Calgary Tan

D Gravel shall conform to the following gradations:

Sieve Size	Percent Passing By Weight
3/8"	100
No. 4	90 - 100
No. 8	65 - 80
No. 16	45 - 65
No. 30	30 - 50
No. 50	20 - 30
No.100	12 - 20
No. 200	5 – 15

2.3 BINDER

A. Binder material shall be a non-toxic, organic binder that is a colorless and odorless powder that binds stone screenings to produce a firm surface.
1. Material shall consist of 95% psyllium with 70% mucilliod content.
2. Material shall be non-toxic, non-staining, odorless and environmentally safe.
3. Particle size: At least 90% shall pass #40 mesh sieve.

B. Binder material shall be:

1. Stabilizer, as manufactured by Stabilizer Solutions Inc. Phoenix, AZ. Phone 800-336-2468, www.stabilizersolutions.com

2. Natracil as manufactured by Gail Materials, Corona, CA. Phone 951-667-6106, www.gailmaterials.net

3. Organic-Lock, as manufactured by Envirobond Products Corporation, Mississauga, ON. Phone 1-866-636-8476, www.envirobond.com

4. Or approved equal.

2.4 EDGING MATERIALS

A. Steel Edging:
Steel edging shall be 3/16 inch thick x 4 inch deep steel bar, with black painted finish. Edging shall be supplied with steel stakes 18 inches long. Steel edging shall be as manufactured by:

1. Thypin Steel Co. Inc., Long Island City, NY 11101. Phone 718-937 2700.

2. J.T. Ryerson & Son Inc., Jersey City, NJ 07303. Phone 201-435 3434.

3. J.D. Russell Company, Fraser, MI. Phone 800- 888-6708.

4. Or approved equal.

B. Steel edging shall be pre-formed by the manufacturer for all corners, angles, and at all radii of 20 feet or less.

2.5 PRE-EMERGENT HERBICIDE

A. Pre-emergent herbicide shall be a granular form of Treflan 5G; Trifluralin HF; Triflurex HFP; or approved equal.

PART III - EXECUTION

3.1 PREPARATION

A. Prior to construction and paving placement operations, the Contractor shall ascertain the location of all existing and proposed subsurface utilities including electric conduits, irrigation, under-drainage systems and all other underground or at grade utilities.

1. Take proper precautions so as not to disturb or damage any sub-surface elements.

2. Any damage to underground utilities or other work shall be repaired at the Contractor's own expense to the satisfaction of the Commissioner.

3.2 PREPARATION OF SUBGRADE

A. Subgrade shall be prepared and compacted in accordance with the requirements of Backfilling: Section 31 23 23.

B. Apply pre-emergent herbicide to finished grade prior to the installation of the base course materials. Herbicide shall be applied in conformance with the manufacturer's instructions.

3.3 EDGING

A. Install steel edging at all locations where stabilized gravel paving abuts other loose materials, including at planting beds, tree pits, and at all locations as shown on the drawings.
   1. Edging shall be installed so that top surface shall be flush with finished grade of paving after compaction.

   2. Edging shall be held in place with steel stakes located at three (3) foot maximum on center.

   3. Top of stake shall not project above top of edging.

B. Reinforce edging as necessary during installation and compaction of material.

C. Realign or replace edging if it is deformed or damaged during installation and compaction of material.

3.4 BASE COURSE

A. Install base course material under all areas of stabilized gravel pavings, between edgings, curbs or other solid structures.

B. Compact the base course to reach thickness shown on the Drawings and to meet 95% maximum dry density.

C. Compaction shall be accomplished by rolling, except in the areas inaccessible to rollers, equivalent compaction shall be accomplished by the use of mechanical tampers, until there is no further evidence of consolation and all roller marks are eliminated.

D. Depressions or high areas which develop during rolling shall be corrected to produce a surface with no variations greater than 1/8" over a ten foot length.

3.5 MIXING STABILIZED GRAVEL PAVING

A. Mix binder material thoroughly with gravel aggregate screenings at the following rate: 15-lbs of binder per 1-ton of gravel top course aggregate, or at the rate directed by the binder manufacturer for project and climate conditions.

B. Binder shall be mechanically pre-mixed per manufacturer's recommendations using an approved mechanical blending unit that will adequately mix and blend the binder with the aggregate.
   1. Always blend binder and aggregate DRY.
   2. Drop spreading of binder over pre-placed aggregate or mixing by rototilling is not acceptable.
   3. Bucket blending is not an approved blending apparatus.

3.6 INSTALLATION OF STABILIZED GRAVEL PAVING

A. Lay two lifts of 2 inches each course (4 inch total thickness) of stabilized crushed aggregate screenings as shown on the drawings.

B. Spread by grading the stabilized crushed aggregate screenings onto the prepared base in a pushing mode and continue in this manner until entire area is covered. At no time shall any vehicle travel directly onto the prepared base.

3.7 WATERING

A. Water heavily for full-depth moisture penetration of profile. Water activates the binder, saturate to total depth.
   1. Apply 25 to 45-gallons of water per 1-ton.
   2. Test moisture using a probing device reaching full depth.

3.8 COMPACTION

A. Compact stabilized aggregate to 85% relative compaction by equipment such as a 2 to 5-ton double drum roller making 3 to 4 passes.
   1. Do not begin compaction for 6 hours after placement and up to 72 hours.
   2. DO NOT use a vibratory plate compactor or vibration feature on roller, as vibration separates large aggregate particles.
   3. If pumping or pancaking of surface occurs, surface is still too wet to roll.
   4. Take care in compacting stabilized aggregate when adjacent to planting and irrigation systems.
   5. Hand tamping with 8 inch or 10 inch hand tamper recommended.
   6. Lightly spray surface area following compaction. Do not disturb aggregate surface with spray action.

B. Finishing: Remove temporary bracing at edging.

C. Tolerances:
1. Final thickness of top course shall not vary more than 1/4 inch from dimensions shown on the drawings.

2. Final grade shall not vary more than ½ inch from elevations shown on the drawings.

3. Grades shall be smooth between high points and low points indicated, with no variation greater than 1/8 inch.

3.9 INSPECTION

A. Finished surface shall be smooth, uniform and solid, with no evidence of chipping, cracking, spongy areas or loose material on the surface.

B. Defects:
1. Loose gravel on the surface, or unconsolidated crushed stone beneath the surface, is evidence of improper bonding due to poor mixing or insufficient watering.

2. Cracking or sponginess is evidence of excess binder material in the mix.

3.10 PROTECTION

A. Protect rolled areas from traffic of any kind until areas are completely dry. Maintain all protection measures in place throughout the course of construction.

B. If newly installed or previously existing stabilized gravel pavements are damaged during the course of the Work, these areas shall be repaired as follows:
1. Excavate damaged area so that all sides are vertical and entire damaged area is clear of debris.

2. If area is dry, moisten damaged portion lightly.

3. Pre-blend the pre-determined amount of binder powder with the pre-determined amount of aggregate in a dry state. This can be blended with a concrete mixer (9 cubic ft.).

4. Add water to the pre-blended stabilized aggregate. Thoroughly moisten mix with 25 to 45 gallons per ton of pre-blended material or to approximately 10% moisture content.

5. Apply moistened pre-blended aggregate to excavated area to finish grade.

6. Compact with an 8 inch to 10 inch hand tamper or use a larger 1000 lb. roller. Keep traffic off areas for 12 to 48 hours after repair has been completed.

7. Following completion of remedial repairs, edges of patched areas shall not be visible.

3.11 CLEAN-UP

A. Upon completion of paving installation, the Contractor shall remove all equipment, tools, excess materials, and debris from the site.

END OF SECTION

SECTION 32 14 20
STONE PAVING

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:

1. Supply and installation of new Granite Paving with mortar setting bed, mortar joints and concrete base.

2. Supply and installation of new Limestone Paving with mortar setting bed, mortar joints and concrete base.

3. Supply and installation of new Bluestone Flagstone Paving with sand setting bed and crushed stone base.

4. Supply and installation of crushed stone, geotextile fabrics, dowels, expansion joints, sealant, pigments and all incidental materials and equipment necessary to complete the work of this Section.

1.3 RELATED WORK

A. Cast-in-Place Concrete: Section 03 30 00

B. Excavation – Earth and Rock: Section 31 23 16

C. Backfilling: Section 31 23 23

D. CU Structural Soil: Section 32 93 90

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Shop Drawings:
Provide dimensioned layout of Limestone paving showing size and arrangement of each stone unit, including size and location of openings for trees and fossils.

C. Samples - Stone:
Samples will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
1. Paver samples for each type of stone specified herein.
2. Clearly mark samples to show finished face.
3. Submit sufficient samples to show complete range of color variation for each type. Submit samples of pavers to show expected range of color variation, and indicate the proportion of variation expected for the Project.

D. Samples - Mortar:
Submit the following samples:
1. Colored pointing mortar samples for each color required showing full range of exposed color to be expected in completed work.

E. Samples - Sealant:
Sample submittals will be reviewed for color only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
1. Colored sealant samples for each type and color of joint sealant required.

F. Manufacturer's Data- Geotextile:
Provide manufacturer's data with sufficient detail to demonstrate compliance with the requirements of this specification.

1.5 FIELD CONSTRUCTED MOCK-UPS

A. After approval of all required submittals as specified herein, prepare in-place mock-up of each type of stone paving at the project site, in approved location.

1. Mock-up shall consist of one section of each type of paving, approximately 10'-0" x 10'-0".

2. Mock-up section shall include joint treatments as specified for the finished work.

3. Approved mock-up section may become part of the final work.

4. Make any changes required until mock-up is approved.

5. Do not proceed with installation of Stone Paving until written approval of mock-ups is obtained.

6. Remove and reconstruct rejected mock-ups.

B. The purpose of the mock-up is to verify the understanding of the specified procedures by the Contractor, and to establish the standards of quality and workmanship in the completed work.

1.6 DELIVERY, STORAGE & HANDLING

A. Deliver all materials to project site in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

B. Store materials at a minimum temperature of 20 degrees F and a maximum temperature of 100 degrees F

C. Store cementitious materials off the ground, under cover and in a dry location.

D. Store pavers on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage or cracking of pavers. Allow air circulation around pavers.

E. Deliver sealants to project site in original unopened containers with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.

F. Prevent staining of pavers from mortar, grout, sealants, and other sources. Immediately remove such materials from pavers without damage to latter.

1.7 ENVIRONMENTAL CONDITIONS

A. Cold Weather Protection:
Comply with the following requirements:
1. Do not use frozen materials or materials mixed or coated with ice or frost.

2. Do not build on frozen subgrade or setting beds.

3. Remove and replace work damaged by frost or freezing.

B. Protect completed work and work in progress to comply with the following requirements: Temperature ranges indicated apply to mean daily temperatures existing at time of installation.
1. At 40 degrees F. to 32 degrees F. protect work from rain or snow at least 24 hours by covering with non-staining weather-resistive membrane.

2. At 32 degrees F. to 25 degrees F. cover work completely with non-staining weather-resistive membrane.

3. At 25 degrees F. to 20 degrees F. cover work completely with non-staining weather-resistive insulating blankets or similar protection for at least 24 hours.

4. At 20 degrees F. and below, maintain work temperatures above 32 degrees F. for 24 hours using enclosures and supplementary heat, electric heating blankets,

infrared lamps or other equally effective and proven methods.

C. Cold Weather Requirements for Mortar, Grout and Sealants:
Do not proceed with installation of mortar, grout or sealants when ambient and substrate temperatures are outside the limits permitted by product manufacturer, or below 40 degrees F, or when joint substrates are wet due to rain, frost, condensation or other causes.
1. Heat materials to provide mortar and grout temperatures between 40 and 120 deg F.

2. Provide the following protection for completed portions of work for 24 hours after installation when the mean daily air temperature is as indicated: below 40 deg F, cover with weather-resistant membrane; below 25 deg F, cover with insulating blankets; below 20 deg F, provide enclosure and temporary heat to maintain temperature above 32 deg F.

D. Hot Weather Requirements for Mortar, Grout and Sealants:
Protect unit paver work when temperature and humidity conditions produce excessive evaporation of setting beds and grout.
1. Provide artificial shade and windbreaks and use cooled materials as required.

2. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

3. When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F, set pavers within 1 minute of spreading setting-bed mortar

PART II - PRODUCTS

2.1 STONE - GENERAL

A. All stone shall conform to the following requirements:
1. Stone shall be hard, durable and free from seams, cracks or other defects.

2. Conform to the requirements of ASTM C615 for strength.

3. Stone shall be of color and tone within range of approved samples.

B. Single-Source Responsibility:
Obtain each type of stone from a single quarry for each product.

C. All granite shall conform to the following additional requirements:
1. Absorption by weight: 0.4% maximum - ASTM C97.

2. Density: 160 lbs/cu.ft. minimum - ASTM C97.

3. Compressive Strength: 19,000 psi minimum - ASTM C170.

4. Modulus of Rupture: 1,500 psi average - ASTM C99.

D. Stone types shall be as shown on the Drawings and described below. Stone type designations refer to stone paving area shown on the Drawings:

2.2 TYPE A: GRANITE BLOCK PAVERS AT FAN PATTERN

A. Stone shall be Royal Auburn Granite (pink and gray color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Phone: 800-328-5040

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.3 TYPE B: GRANITE PAVERS AT SWALE TRAIL CENTER STRIP

A. Stone shall be Lake Placid Blue Granite (blue and gray color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040.

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.4 TYPE C: GRANITE BLOCK PAVERS AT SWALE TRAIL EDGE BANDS

A. Stone shall be Mountain Green Granite (green and black color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320.
Contact: Randy Huber, 800-328-5040.

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.5 TYPE D: GRANITE BRIDGE RAMPS

A. Stone shall be Lake Superior Green Granite (green and gray color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040.

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.6 TYPE H: LIMESTONE PAVERS AT TREE FOSSILS

A. Stone shall be Irish Blue Limestone with stylolite fossils (blue-gray and white color) available from:
Irish Limestone Company, 74 Mack Avenue, Scarborough, ON M1L-1M9, Canada
Contact: Fergus Tyrrell, 416-388-2291, info@irishlimestonecompany.com

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.7 TYPE I: BLUESTONE FLAGSTONE PAVERS

A. Stone shall be Bluestone (blue-gray-rust colors) available from:
New York Quarries Inc, 305 Route 111, Alcove, NY
Contact: 518-756-3138, info@alcovestone.com

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
1. Top: natural cleft finish. Cleft finish shall have no variation across surface greater than 1/8 inch.
2. Sides: Sawn or split-faced finish.
3. Bottom: Sawn or split-faced.

2.8 CONCRETE

A. All concrete shall comply with the requirements of Cast In Place Concrete: Section 033000.

2.9 CRUSHED STONE

A. Crushed stone shall conform to the following gradations, equal to New York State D.O.T. Type 4 Subbase course:

U.S. Sieve Size	Percent Passing By Weight
2"	100
1/4"	30 - 60
#40	5 - 40
#200	0 - 1

2.10 SAND SETTING BED MATERIAL

A. Sand for setting bed shall consist of clean, hard, durable, uncoated particles, conforming to the following:

Sieve Size	Percent Passing By Weight
1/4"	100
No.50	0 - 35
No.100	0 - 10

2.11 GEOTEXTILE

A. Geotextile shall be:
1. FX-60HS (nonwoven) as manufactured by Carthage Mills, Cincinnati, OH
2. 160N (nonwoven) by Mirafi, Inc., Charlotte, NC
3. TerraTex N06 (nonwoven) by Hanes Geo Components, Edison, NJ
4. Approved equal.

2.12 MORTAR AND GROUT MATERIALS

A. Portland Cement:
ASTM C150, Type I, except Type III may be used for cold weather construction. Provide gray or white cement as needed to produce mortar color required.

B. Hydrated Lime: ASTM C207, Type S.

C. Pointing Mortar Sand or Aggregate:
ASTM C144. Use aggregate graded with 100 per cent passing the No. 16 sieve.

D. White Mortar Aggregates:
Natural white sand or ground white stone.

E. Colored Mortar Aggregates:
Ground marble, granite, or other sound stone, as required to match approved sample.

F. Mortar Pigments:
Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar

mixes.

G. Water: Clean, non-alkaline, and potable.

2.13 MORTAR MIXES

A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water-repellent agents, anti-freeze compounds, or calcium chloride, unless otherwise indicated.

B. Mixing:
Combine and thoroughly mix cementitious materials, water and aggregates in a mechanical batch mixer. Comply with referenced ASTM standard for mixing time and water content, unless otherwise indicated.
1. Use only enough water to produce a stiff mix that produces a moist surface at time stone is set.

C. Setting Mortar:
Mortar at all setting beds shall comply with ASTM C270, Type S, and shall consist of:

1 part Portland cement

1/2 part lime

4-1/2 parts sand

D. Pointing Mortar:
Pointing mortar at all visible joints shall comply with requirements indicated above for setting mortar, with additional pigments added to produce color to match approved sample.
1. Select and proportion pigments with other ingredients to produce color required.

2. Do not exceed pigment-to-cement ratio of 1 to 10, by weight.

2.14 EXPANSION JOINTS & SEALANTS

A. Expansion joint filler and sealant materials shall be as manufactured by:
Williams Products Inc, Troy, MI. Telephone (800) 521 9594.
Nomafoam, Zebulon, NC 27597. Telephone (800) 345-7279
Pecora Corp., Harleysville, PA 19438. Telephone (800) 523-6688.
Or Approved Equal.

1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.

2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.

3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.

4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.

5. Sealant colors shall be selected from full range of colors available.

2.15 PRE-EMERGENT HERBICIDE

A. Pre-emergent herbicide shall be a granular form of Treflan 5G; Trifluralin HF; Triflurex HFP; or approved equal.

PART III - EXECUTION

3.1 PREPARATION - GENERAL

A. Examine all surfaces to receive stonework, and correct all conditions which are not in compliance with the requirements specified herein, or which are unsatisfactory in any way. It shall be the responsibility of the Contractor to ensure that all footings, and all subgrades, bases and surfaces to receive stonework, are clean, level and adequately prepared.

B. Clean all surfaces of stones which have become dirty or stained prior to setting.
1. Remove all soil, stains and foreign materials.

2. Clean stones by thoroughly scrubbing stones with fiber brushes followed by a thorough drenching with clear water.

3. Use only mild cleaning compounds that contain no caustic materials or abrasives.

C. Paving and joints shall match approved mock-up. Any work not meeting the standards of the approved mock-ups shall be removed and reconstructed.

3.2 PREPARATION OF SUBGRADE

A. Subgrade shall be prepared and compacted in accordance with the requirements of Backfilling: Section 31 23 23.

B. Apply pre-emergent herbicide to finished grade prior to the installation of the concrete base slab. Herbicide shall be applied in conformance with the manufacturer's instructions.

3.3 STONE PAVEMENTS ON CONCRETE BASE

A. Concrete base slab and shall be installed in accordance with the requirements of Cast In Place Concrete: Section 03 30 00.

1. Slab shall have a smooth float finish or broom finish.

2. Before installing setting bed, verify slab placement to correct line and grade and with correct finish.

3. Correct any unsatisfactory conditions in the base slab prior to the installation of paving materials. Do not begin paving and surfacing work until unsatisfactory conditions have been corrected and substrate is ready to receive paving.

4. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

5. Before starting the installation in any area, the concrete slab shall be cleaned to remove solid and loose mortar.

6. Dry or dusty concrete surfaces shall be wet down or washed and excess water removed just prior to the application of paver systems

B. Mortar Setting Bed:

1. Place and shape mortar setting bed to full depth, typically 3/4 inch minimum, or as shown on the Drawings. Screed setting mortar level.

2. The area of bedding course placed in any work day shall be scheduled so that no bedding course remains at the end of the day without a paver course. After final shaping, the bedding course shall not be disturbed prior to laying paver units.

3. Install anchors, supports, fasteners, and other attachments shown, or necessary to secure stone in place. Shim and adjust accessories as required for proper setting of stone. Completely fill holes, slots and other sinkages for anchors, dowels, fasteners and supports with mortar during setting of stone.

C. Paver Installation Tolerances:

1. Variation of slope and grade:
Check slope and grade of installed paving units with a 12-foot straight-edge. Surface shall be true to grades and slopes indicated within 1/8" in ten (10) feet.

2. Offset at joints: Not to exceed 1/16 inch.

D. Laying Pavers:

1. Lay in patterns indicated on Drawings. Joints shall align or be on centerlines as indicated on Drawings. Field check all dimensions.

2. When ready for setting, all paving units shall be clean and free from stain, dirt, or dust. If necessary, scrub face with mild soap and clean water applied with stiff fiber brushes. Rinse well with clean water.

3. Stone pavers shall be cut to fit around items penetrating surfaces Where cutting is required, execute cutting with a high-speed masonry saw producing squared, clean, and sharp edges.

4. The surface edge of one paver shall be level with the next adjacent pavers so that no voids, rocking motions, or tripping hazards are encountered. In addition, comply with specified tolerances.

5. Any unit having a hollow sound after being laid shall be reset to provide solid backing.

6. Maintain exposed faces of paving units free of setting bed and/or joint mortar. Any mortar or grout which gets on exposed faces shall be immediately removed with sponge and clean water.

E. Mortar Joints

1. Stone paving units shall be kept perfectly clean throughout installation, and joints between shall be raked out to a depth of ½" for joint mortar.

2. After all paving and other surfacing materials have been set and setting bed is thoroughly cured (minimum 36 hours), brush joints clean.

3. Thoroughly wet raked out portion of joint, and then fill solid with colored mortar to match approved sample.

4. After initial set of mortar joints shall be finished by tooling joint with a non-staining jointer to produce a dense, slightly concave surface, flush with paving unit surface.

F. Curing:

1. After installation all joints shall be cured for a minimum of five (5) days, by covering with curing paper or other approved material.

G. Expansion Joints

1. Provide expansion joints where paver units abut other constructions and at all locations shown on the Drawings. Do not fill with mortar.

2. Install continuous strips of preformed joint filler. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.

3. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.

4. Sealant shall be flush with finished surface of stone.

3.4 BLUESTONE FLAGSTONE PAVING ON SAND BED

A. Preparation:

1. The excavation shall be completely cleared of all debris and undesirable material.

2. The excavation shall not be muddy, waterlogged, or otherwise unsatisfactory.

3. If the excavation becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment.

4. Fine grade all areas to receive paving and compact subgrade evenly to 95% modified proctor, in accordance with the requirements of Backfilling: Section 31 23 23.

5. All areas shall be compacted with a self-propelling vibrating roller weighing not less than ten (10) tons.

6. All hollows and depressions which develop under rolling shall be filled with controlled fill or select fill, and re-compacted.

7. Spread pre-emergent weed killer over compacted base course, at a rate of 5 lbs per 1,000 square feet, using equipment as recommended by the manufacturer to ensure a uniform application.

B. Geotextile:

Install geotextile at elevations and alignments as indicated on the Drawings.

1. Geotextile shall be placed loosely with no wrinkles or folds. Care will be taken to place the geotextile in close contact with the soil so that no void spaces occur between the geotextile and ground.

2. At joints between fabric sections the geotextile shall be overlapped twelve (12") inches.

3. If the geotextile is damaged during installation, the rupture shall be removed and the damaged area shall be covered with a patch of new fabric which will overlap the undamaged fabric approximately six (6") inches in all directions. All repaired fabric surface costs will be deemed part of the price bid.

C. Crushed stone base course shall be evenly spread on the prepared excavation in the location shown on the plans, in four (4) inch layers, each layer rolled while wet with a ten (10) ton roller.

1. Adjust base course elevation as required so that when pavers are placed, the top surface of the pavers will be at the required finished grade.

2. Base course shall be wetted immediately before placement of paving.

D. Edging:
Install edging against side of base course material as shown on the Drawings, so that the top of edging will be flush with top surface of pavers.
1. Verify the completion and correct alignment of all other edgings specified elsewhere, prior to installation of pavers.

E. Sand Setting Bed:
Place sand bed material over crushed stone base.
1. Compact sand bed prior to paver installation. Calculate degree of compaction and adjust bed with straight edge to bring the pavers, when laid, to proper grade.

2. Fill low areas in setting bed with additional sand to produce smooth, firm and even setting bed.

3. Install setting bed only over area which will be covered by pavers during the same day.

F. Paver Installation:
Place the pavers by hand in patterns as shown on Drawings, maintaining a uniform top surface.
1. Where cutting is required, use a diamond blade masonry saw.

2. As soon as a sufficiently large area of pavers has been installed, compact pavers into setting bed using a hand-tamper.

3. Following compaction, brush clean sand over pavers to completely fill all voids.

3.5 PROTECTION

A. Protect newly installed pavers with panels of plywood on which the installer stands.
1. Plywood can be advanced as work progresses. Plywood protection must be kept in areas which will be subjected to continued movement of materials and equipment.

2. Cover top of paving and other stonework with non-staining waterproof sheeting at end of each day's work. Covers shall be securely held in place.

3. Cover partially completed paving when work is not in progress.

B. Prevent staining of stone from mortar, or other sources. Immediately remove such materials from stone without damage to latter. Protect stone work from rain-splashed mud and mortar splatter by means of adequate coverings.

3.6 ADJUSTMENTS

A Replace or repair defective, broken or damaged stone units or system components, including but not limited to the following defects:

1. Stones and joints not matching approved samples.
2. Broken, chipped, stained, or otherwise damaged stones.
3. Defective setting beds.
4. Unfilled or defective joints.
5. Uneven settling, or other evidence of improper bedding or alignment..
6. All other defects as directed by the Commissioner.

3.7 CLEAN-UP

A. After all mortar is thoroughly set and cured, clean all stonework to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.

B. After completion of the work, the contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

END OF SECTION

SECTION 32 31 19
DECORATIVE METAL FENCES AND GATES

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. Related Work specified in other sections includes, but is not limited to, the following:
   1. Section 05 50 00 – Metal Fabrications
   2. Section 05 12 00 – Structural Steel Framing

1.2 SECTION INCLUDES

A. This Section describes the general requirements for the Nature Walk south side fence and gate. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all decorative fence and gate Work.

1.3 REFERENCES

A. Codes and standards referred to in this Section are:
   1. Structural AWS A5.12 - Tungsten and Tungsten Alloy Electrodes for Arc Welding and Cutting
   2. AWS C2.18.93 - Guide for the Protection of Steel with Thermal Spraying Coating of Aluminum and Zinc
   3. AWS - Standard Codes for Arc and Gas Welding in Building Construction
   4. SSPC CS- Guide 23.00 - Coating System Guide, Guide for Thermal Spray Metallic Coating Systems
   5. ASTM B833-93 - Standard Specification for Zinc Wire for Thermal Spray
   6. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
   7. NAAMM - National Association Of Architectural Metal Manufacturers

1.4 DESIGN REQUIRMENTS

A. Maintain the visual design concept shown, and the technical requirements specified, including modules, profiles, alignment of components and requirements for finish.

B. Thermal Control: Provide adequate expansion joints within the fabricated system which allows for all thermal expansion and contraction caused by a material temperature range of 140 degrees F to -20 degrees F without warp or bow of system components. Distance between expansion joints shall be based on providing a 1/4 inch wide joint at 70° F which accommodates a movement of 150 percent of the calculated amount of movement for the specified temperature range.

C. Provide fences capable of withstanding the effects of gravity loads and the following loads:

1. 90 mph windload assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

D. Provide expansion joints in decorative fencing Work where systems cross expansion joints in structure.

E. Configuration of all decorative fences and gates shall be as shown on the Contract Drawings. All details shown on the Contract Drawings are typical; similar details apply to similar conditions, unless specifically noted otherwise on the Contract Drawings. Verify dimensions at the site without causing delay in the work.

F. Fasteners and Supports:

1. When the size, length or load carrying capacity of an anchor bolt, concrete anchor or concrete insert is not shown on the Contract Drawings, provide the size, length and capacity required to carry the design load times a minimum safety factor of four.

2. Sizes shown on the Contract Drawings shall be considered minimum. Increase size to comply with design loadings and minimum safety factor specified.

G. Sliding Gate Assembly Design:

1. Design Components:

a. Provide a complete sliding gate system including guide assembly, track components, and associated hardware needed in order to operate the gate for its intended function.

b. Provide additional structural support or reinforcement needed in order to operate the gate for its intended function including the reinforcement

of the sliding gate and the adjacent fixed fence posts to support all weight and loads of the sliding cantilever gate.

1.5 SUBMITTALS

A. The Contractor shall submit the following in accordance with the requirements of the DDC General Conditions.

B. Samples:

1. Full size fence section mockup and gate section with all associated connections, and mounting brackets all with specified controlled uniform finish.

2. All Mockup will be reviewed by Commissioner for color, finish, joinery appearance and workmanship only. Compliance with all other requirements is the responsibility of Contractor.

C. Shop Drawings:

1. Drawings for the fabrication and erection of decorative fences and gates with sizes of members, components and anchorage devices, all based on specified requirements. Include copies of manufacturer's specifications, standard and custom detail drawings and installation instructions for decorative fences and gates. Include all plans and elevations identifying the location of all decorative fences and gates, and all expansion joints.

2. Profiles of decorative fences and gates components, and the details of forming, jointing, sections, connection, internal supports, trim, and accessories. Show details drawn at 1-1/2 inch scale.

3. All calculations for complete structural analysis of the systems including calculations showing compliance with the design requirements specified. Calculations shall be signed by a professional engineer licensed in the State of New York with experience in the design of sliding gate assemblies.

4. Manufacturer's catalogs showing complete selection of standard and custom components and miscellaneous accessories for selection by the Commissioner.

5. Portable steel container for long-term storage of spare parts and maintenance materials.

D. Certificates:

1. Copies of material purchase receipts, for this job, signed by a certified and licensed Notary Public, verifying that material purchased for the Work complies with material designations specified as confirmed by approved Working Drawings.

2. Certification of welders and welding procedures shall be submitted as specified.

3. Installer qualifications.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Engage a single fabricator, with undivided responsibility for detailing and performance of the decorative fences and gates.

2. Engage a firm which can show three (3) years previous successful experience in detailing and fabrication of decorative fences and gates of scope and type similar to the required work.

3. Materials and fabrication procedures shall be subject to inspection and tests in the mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests shall not relieve the Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

B. Installer Qualifications:

1. Engage a single installer skilled, trained and with documented successful experience in the installation of decorative fences and gates and with specific skill and successful experience in the erection of the types of materials required; and who agrees to employ only tradesmen with specific skill and successful experience in this type of Work.

C. Source Quality Control:

1. Obtain all decorative fences and gates components and accessories from the same manufacturer.

2. Provide qualified welding processes and welding operators in accordance with AWS "Structural Welding Code" D1.1, Section 5, Qualification.

3. Provide certification that all welders employed on, or to be employed for, the fabrication of the decorative fences and gates have satisfactorily passed AWS qualification tests within the previous twelve months. Contractor shall ensure that all certification are kept current.

1.7 PROJECT CONDITIONS

A. Protection: Protect field-drilled holes from debris and water intrusion by use of temporary covers or removable foam inserts.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials:

1. Deliver decorative fences and gates and all accessories dry and undamaged, with manufacturer's protective coating intact, bearing original intact factory labels.

2. Decorative fences and gates which are damaged during delivery or while being unloaded shall not be stored on site. Remove such units from site and replace panels with new, undamaged material.

B. Storage of Materials:

1. Store decorative fences and gates and accessory materials under tarpaulin covers and in an area protected from dirt, damage, weather and from the construction activities. Do not store outside or allow items to become wet or soiled in any way while on site.

2. Do not store in contact with concrete, earth or other materials that might cause corrosion, staining, scratching or damage to finish. Do not install system components which become dented, scratched or damaged in any way. Remove such components from site and replace with new, undamaged material.

C. Handling of Materials

1. Do not subject decorative fences and gates and accessory materials to bending or stress. Do not carry or transport panels in the horizontal (flat) position. Hold panels upright on edge when handling.

2. Do not damage edges or handle material in a manner that will cause scratches, warps or dents.

PART II - PRODUCTS

2.1 MATERIALS

A. Provide posts, pickets and rails of structural steel in the sizes shown and conforming to Section 05 12 00 Structural Steel Framing.

B. Brackets, Flanges, and Inserts: Provide structural steel brackets, flanges and inserts. Furnish structural steel inserts as required for anchorage to concrete or masonry. Components shall be selected by the Commissioner from manufacturer's standard and custom components. Components shall be in accordance with manufacturer's recommendations and as acceptable to the Commissioner as shown on approved Working Drawings.

C. Accessory and Miscellaneous Materials: Provide all accessory items and system components structural steel, finished to match decorative fences and gates unless otherwise noted.

D. Concrete and Masonry Anchors: Concrete and masonry anchors shall be as specified in Section 05 12 00 Structural Steel Framing.

E. Non-Shrink, Non-Metallic Grout:

1. Pre-mixed non-staining cementitious grout requiring only the addition of water.

2. Product and Manufacturer: Provide one of the following:

a. Euco N-S by The Euclid Chemical Company.

b. Masterflow 713 by Master Builders Company.

c. Sika Grout by Sika Corporation

d. Or approved equal.

F. Bolting Materials: As specified in Section 05 12 00 Structural Steel Framing.

2.2 FABRICATION AND SHOP ASSEMBLY

A. Provide decorative fences and gates completely factory fabricated using fabrication techniques recommended for structural steel. Use tools and fabrication equipment dedicated only to the fabrication of structural steels to completely eliminate ferrous contamination.

B. Field Measurement: Take field measurements where required, prior to preparation of Working Drawings and fabrication, to ensure proper fitting of the Work.

C. Preassemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

D. Fencing shall be assembled in sections as long as practical. Posts shall be connected to flanges by welding.

E. Weep Holes:

a. Provide 15/64 inch diameter weep holes at the lowest point on all hollow pickets and posts and along the bottom side of hollow horizontal members.

b. Provide pressure relief holes at closed ends of hollow members.

2.3 WELDING

A. Welding shall comply with the requirements of AWS, NYBC and BSA.

B. All welding must be done in shop. Field welding shall not be permitted unless approved by the Commissioner.

C. All welding shall be performed with Inert Gas Tungsten Arc Welding using Direct Current, Straight Polarity. The non-consumable electrode shall be 1/16-inch diameter, 2 percent thoriated tungsten electrode and have a point ground on the end similar to a pencil point. The welding current shall be between 70 and 100 amperes. The shielding gas shall be argon, helium or a combination of both with a minimum flow of 15 cubic feet per hour. Filler metal shall be structural steel.

D. All welds shall be ground smooth, then finished to blend with the structural steel members and have a comparable surface finish.

2.4 THERMAL SPRAYED METAL COATING (METALLIZING)

A. All exposed members must be Metallized as per SSPC, AWS, and ASTM standards and recommendations. Thermal sprayed metal coating shall be done prior to powder coating, in shop.

2.5 FINISH:

A. All exposed fence and Gate members shall be powder coated finish. Type and color shall be Polyester Z series AG Metallic Silver as per Pro-tech; Interpon D2000; Sherwin Williams Powdura Super Durable TGIC Free Polyester; or approved equal. Powder coating shall be applied in shop.

B. All gate motors shall also have their casing powder coated to match color of fence and gates with anti-graffiti coating as a final coating

1. Film thickness is to be greater than 60-76 microns on average.

2. The powder must be fully cured as per the powder manufacturer's specification

C. Finish: cleaning and chemical per-treatment: this application is required for all fencing panels, posts and gates prior to application of the specified coating system.

D. New zinc surfaces are to be examined for flux residues, light roll forming oils and foreign matter are to be removed prior to pre-treatment for powder coating.

E. Surfaces that show white storage stain (white rust) or other corrosion products, must be cleaned, degreased and per-treated for optimal performance. White rust can lead to adhesion problems or out-gassing of the powder coating. Silicone based anti-spatters are not to be used as they may lead to de-wetting of the powder.

F. Powder application must occur within in 24 hours of substrate pre-treatment.

G. Pre-treatment system are to be maintained and tested in accordance with the pretreatment supplier's recommendations.

2.6 ANTI- GRAFFITI COATING

A. Applied an anti-graffiti coating on all members of the fence and gates. The anti-graffiti coating shall be Protective Marine Coating type. Color shall be Clear coat.

2.7 SLIDING GATE:

A. Gate frame: horizontal supports size shall be as indicated on drawing

B. Motorized gate: The Contractor is responsible for providing a complete and operational motorized slide gate operator at locations indicated on the drawings and as follows:

1. Comply with ASTM F1184-05(2010) Standard Specification for Industrial and Commercial Horizontal Slide Gates

2. Provide custom cantilevered gates in material and design as shown on the drawings.

3. Provide cast aluminum guiding rollers.

4. Provide motorized gates capable of withstanding the effects of gravity loads and the following loads:

   a. 90 mph windload assuming 50 percent coverage with hanging plastic banners and signage and/or windscreen.

   b. Loads imposed by the operation of the door.

5. Operation: By means of a metal rail passing between a pair of hydraulically driven solid metal wheels with polyurethane treads.

a. Inherent Safety Mechanism: Hydraulic.

b. Braking: Hydraulic

c. Solid state control board

d. Programmable closer timer: 1- 99 seconds

6. Motor: Hydraulic, geroller type. With no belts, gears, pulleys, roller chains or sprockets to transfer power from operator to gate panel.

   a. Coordinate motor size with actual gate weight to comply with the operator pull force indicated.

7. Operator pull force: 300 pounds minimum horizontal pull force without the drive wheels slipping and without distortion of supporting arms and capable of moving the gates at the indicated speed.

8. Gate speed: min 1.0 ft per second capable of stopping gradually to prevent shock loads to the gate and operator assembly.

9. External sensors: Combination of photo eyes and gate edges to be installed such that the gate is capable of reversing in either direction upon sensing an obstruction.

   a. Photocells shall be provided to meet UL 325 for Class III gates. Provide a maximum transmit distance of no less than 65 feet, with power of 2 VDC, relay contacts that are 30V, 1A, in a NEMA 4X enclosure with a protective hood. Provide mounting post or mounting bracket and hardware as required. Photocells shall have an operating temperature of -40 degrees F to 170 Degrees F.

   b. Padded contact edge sensors shall be provided to reverse gate on contact with any object. Provide edge sensors at both vertical ends of the ornamental slide gate covering the full length of the vertical ends. Provide with hardware necessary to interface with the gate controller.

10. Control device: Key-switch. At Commissioner's request make provisions to integrate Key to instructed keying system. Provide digital keypad with call button and durable 8 ohm speaker that allows integration with built-in intercom station. Keypad to be high grade, stainless steel faceplate and metal keypad and housed in a heavy metal powder coated enclosure. Keypad to provide two (2) relays and an external event input.

    a. Input: 12-24 VAC
    b. Output: normally open or normally closed contact.
    c. Operating temperature: -15 to 175 Fahrenheit
    d. Face plate: 16 gauge stainless steel

e. Enclosure: 16 gauge powder coated.
f. Intercom: 8 ohm mylar speaker with call button.
g. Relays: rated at .5A @ 120v
h. Warranty: two year
i. Acceptable Manufacturers: Advantage DK digital keypad, Carefree Security, Door King, or approved equal.

11. Drive Rail: Extruded aluminum type 6061 T6, not less than 1/8" thick. With incorporated alignment pins for ease of replacement or splicing and enabling a perfect butt splice.

12. Gate Operator: Provide a slide gate operator with the following characteristics:

a. Provide Stainless steel chassis and tamper proof heavy gauge motor cover.
b. Provide Heater with thermostat control for cold climate.
c. Provide weather-stripped drive rail slot in chassis, and snow wiper blades for drive rail.
d. Provide Lock for operator cover.
e. Acceptable Manufacturers: HySecurity SlideDriver; LiftMaster; Door King; or approved equal.

13. Provide all minimum standard mechanical and electrical components listed in manufacturer's printed literature associated with the gate operator.

C. Catcher bracket/ stopper post: shall be metalized steel and powder coated.

1. Gate stops to be mounted as indicated on the drawings or is to be fixed in position with (4) heavy duty galvanized dyne bolt which are to be anchored in concrete footing. The upright gate stop is to be braced to combat movement though constant impact.

2.8 ACCESS CONTROL DEVICES:

A. Key operated motor shall be as per Electrical Specifications

B. Provide access control gate controller and key pad with capability to send and receive signals that can be tied into existing plant access control system. Gate controller and keypad must interact with access control system to provide the following functions:

1. Speaker intercom communication
2. Automatic closing feature for the gate
3. Open/close gate function ability from main control remote location
4. Or approved equal

C. Emergency vehicle access (fire, police, etc.)

2.9 EMERGENCY CALL BOXES:

A. MANUFACTURERS

1. Lexan Call box
2. Rath Emergency VoIP
3. Valcom IP emergency Call Station
4. Or approved equal

B. Provide emergency call box similar to existing plant emergency call boxes. Call boxes to be solar powered, equipped with internal wireless modem that can provide up to 3 to 5 miles coverage, battery powered with solar panel recharging. Call boxes must have the ability to be connect wirelessly to the New York Police Department. Call box to be designed to be vandal-resistant and meet the requirements of Americans with Disabilities Act (ADA-Compliant)

C. Provide the following Call Box accessories requirements for installation

1. 4" O.D. steel pole mounted in ground with concrete base.
2. Pole mounting bracket kit.
3. Pole cap assembly kit with weather resistant cable entry
4. Solar Panel
5. Stainless steel ringer bracket
6. Antenna kit
7. Indication signage to indicate call box location
8. Signage mounting brackets

D. All Call Boxes to be mounted and installed per the manufactures instructions.

PART III - EXECUTION

3.1 INSPECTION

A. The Contractor shall examine the alignment of the substrate and conditions under which the decorative fences and gates work is to be performed and notify the Commissioner in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Commissioner.

3.2 CUTTING, FITTING AND PLACEMENT

A. Perform cutting, drilling and fitting required for installation. Set the work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

B. Fit exposed connections accurately together to form tight hairline joints. Do not cut or abrade the surface of units which have not been finished after fabrication, and are intended for field connections.

3.3 ALIGNMENT AND ADJUSTMENT

A. Adjust fencing and gates prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Plumb posts in each direction.

3.4 CLEANING AND REPAIR

A. Cleaning: Clean exposed surfaces of decorative fences and gates before leaving the site after completion of installation. Do not use abrasives or non-approved solvent cleaners. Test cleaning techniques on an un-used section of decorative fence or gate before employing cleaning technique in the work.

1. Remove all stains, dirt, grease and other substances by washing the decorative fences and gates thoroughly using clean water and soap. Rinse with clean water.

2. Do not use acid cleaning solutions, steel wool or other harsh abrasives.

3. If stains remain after washing, remove section of fence or gates and replace with a new section in accordance with recommendations of the manufacturer.

B. Leave fencing system and gates, free from dents, burrs, scratches, holes and other blemishes. Refinish minor scratches to be indistinguishable from adjacent un-scarred areas. If, after refinishing, damage remains visible when viewed from five feet away, or if finish of work has been altered to the point where it appears different from adjacent work, Contractor shall replace damaged work with new undamaged material at no additional expense to the City.

C. At the completion of the work, clean or replace adjacent work, marred by the work of this Section.

D. Remove all materials and debris and leave the site in clean condition.

END OF SECTION 32 31 19

SECTION 32 40 10
STONEWORK

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of custom fabricated stone site furnishings including:
      a. Linear stone benches
      b. Stone benches with wood seats
      c. Stone seating at circular shelter
      c. Stone tables and benches
      d. Stone drinking fountain
      e. Linear stone boulders
      f. Natural stone boulders

   2. Etching of graphic and text at stone table.

   3. Installation only of Tree Fossils.

   4. Supply and installation of concrete bases, crushed stone sub bases, geotextile fabrics, dowels, expansion joints, sealant, pigments and all incidental materials and equipment necessary to complete the work of this Section.

1.3 RELATED WORK

A. Cast-in-Place Concrete: Section 033000

B. Metal Fabrications: Section 055000

C. Excavation – Earth and Rock: Section 312316

D. Backfilling: Section 312323

E. Stone Paving: Section 321420

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Shop Drawings:
Submit complete and dimensioned layout drawings, including dimensioned locations of all anchors and joints for each item specified herein.

C. Manufacturer's Data:
1. Epoxy grout
2. Stone adhesive
2. Mortar coloring

D. Samples - Stone:
Samples will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
1. Samples shall be a minimum of 6" x 6" x 3/4" thick.

2. Submit stone samples for each type of stone specified herein.

3. Clearly mark samples to show finished face.

4. Submit sufficient samples to show complete range of color variation for each type. Indicate Samples of pavers with color variations shall be submitted with proportion of variation expected for use on the Project.

5. For etched stonework, submit samples showing lettering and graphics. Graphics may differ from actual work, but shall include both straight and curved lines and text similar in complexity to actual work. Commissioner will supply full-size layout of all lettering and other graphics to be etched into stone items.

E. Samples - Mortar:
Submit the following samples:
1. Colored pointing mortar samples for each color required showing full range of exposed color to be expected in completed work.

1.5 DELIVERY, STORAGE & HANDLING

A. Deliver all materials to project site in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

B. Store materials at a minimum temperature of 20 degrees F and a maximum temperature of 100 degrees F

C. Store cementitious materials off the ground, under cover and in a dry location.

D. Store stone, wood and metal items on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage or cracking, and to allow air circulation.

1.6 ENVIRONMENTAL CONDITIONS

A. Cold Weather Protection:
Comply with the following requirements:
1. Do not use frozen materials or materials mixed or coated with ice or frost.

2. Do not build on frozen subgrade or setting beds.

3. Remove and replace work damaged by frost or freezing.

B. Protect completed work and work in progress to comply with the following requirements: Temperature ranges indicated apply to mean daily temperatures existing at time of installation.
1. At 40 degrees F. to 32 degrees F. protect work from rain or snow at least 24 hours by covering with non-staining weather-resistive membrane.

2. At 32 degrees F. to 25 degrees F. cover work completely with non-staining weather-resistive membrane.

3. At 25 degrees F. to 20 degrees F. cover work completely with non-staining weather-resistive insulating blankets or similar protection for at least 24 hours.

4. At 20 degrees F. and below, maintain work temperatures above 32 degrees F. for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other equally effective and proven methods.

C. Cold Weather Requirements for Mortar, Grout and Sealants:
Do not proceed with installation of mortar, grout or sealants when ambient and substrate temperatures are outside the limits permitted by product manufacturer, or below 40 degrees F, or when joint substrates are wet due to rain, frost, condensation or other causes.
1. Heat materials to provide mortar and grout temperatures between 40 and 120 deg F.

2. Provide the following protection for completed portions of work for 24 hours after installation when the mean daily air temperature is as indicated: below 40 deg F, cover with weather-resistant membrane; below 25 deg F, cover with insulating blankets; below 20 deg F, provide enclosure and temporary heat to maintain temperature above 32 deg F.

D. Hot Weather Requirements for Mortar, Grout and Sealants:
Protect unit paver work when temperature and humidity conditions produce excessive evaporation of setting beds and grout.
1. Provide artificial shade and windbreaks and use cooled materials as required.

2. Do not apply mortar to substrates with temperatures of 100 deg F and higher.

3. When ambient temperature exceeds 100 deg F, or when wind velocity exceeds 8 mph and ambient temperature exceeds 90 deg F, set pavers within 1 minute of spreading setting-bed mortar

PART II - PRODUCTS

2.1 STONE - GENERAL

A. All stone shall conform to the following requirements:
   1. Stone shall be hard, durable and free from seams, cracks or other defects.
   2. Conform to the requirements of ASTM C615 for strength.
   3. Stone shall be of color and tone within range of approved samples.

B. Single-Source Responsibility:
Obtain each type of stone from a single quarry for each product.

C. All granite shall conform to the following additional requirements:
   1. Absorption by weight: 0.4% maximum - ASTM C97.
   2. Density: 160 lbs/cu.ft. minimum - ASTM C97.
   3. Compressive Strength: 19,000 psi minimum - ASTM C170.
   4. Modulus of Rupture: 1,500 psi average - ASTM C99.

D. Stone types shall be as shown on the Drawings and described below.

2.2 CUSTOM FABRICATED LINEAR STONE BENCHES

A. Stone shall be Chester Blue Granite (blue-gray color) available from:
Chester Granite Company, 2200 Algerie Road, Blandford, MA 01008
Contact: Allen Williams, 413-269-4289, allen@chestergranite.com

B. Sizes shall be as shown on the Drawings. Seat shall be a single monolithic stone unit.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

2.3 CUSTOM FABRICATED WOOD & STONE BENCHES

A. Stone shall be Lake Superior Green Granite (green and gray color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040.

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at seat back rest.
Rock-face at all other exposed faces.
Sawn or thermal at unexposed faces.

D. Wood for seats shall conform to the requirements of Section 324020 Wood Furnishings.

E. Steel frame shall hot-dipped galvanized, sizes as shown on the Drawings.

2.4 CUSTOM FABRICATED STONE SEATING AT CIRCULAR SHELTER

A. Stone for seats shall be Glacier Blue Granite (blue color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040

B. Sizes shall be as shown on the Drawings. Seat shall be a single monolithic stone unit.

C. Finish shall be:
Thermal at top surface and interior exposed faces
Rock-faced at exterior exposed faces.
Sawn or thermal at unexposed faces.

2.5 CUSTOM FABRICATED STONE & STEEL TABLES & BENCHES

A. Stone for table tops and seats shall be Mountain Green Granite (green and black color) available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Thermal at all exposed faces.
Sawn or thermal at unexposed faces.

D. Framework shall be fabricated from hot-dipped galvanized steel tubes and plates, sizes as shown on the Drawings,

E. Adhesive:
Industrial adhesive to secure stone slabs to steel frameworks shall be a fast curing, one-part polyurethane adhesive. Adhesive shall be capable of forming watertight, weather-resistant seal between stone and steel with flexibility to account for temperature related swelling or shrinking.

2.6 CUSTOM FABRICATED STONE DRINKING FOUNTAIN AT CIRCULAR SHELTER

A. Stone for drinking fountain shall be Morton Gneiss (AKA Rainbow Granite), red and black color, available from:
Cold Spring Granite, 17482 Granite West Road, Cold Spring, MN 56320
Contact: Randy Huber, 800-328-5040

B. Size shall be as shown on the Drawings. Drinking fountain shall be a single monolithic stone unit. Final Stone shaping shall be done only in the presence of the Project Artist.

C. Finish shall be:
Rock-faced at all exposed faces.
Polished at drinking fountain bowls only.
Sawn or thermal at unexposed faces.

2.7 LINEAR STONE BOULDERS

A. Linear stone boulders shall be Chester Blue Granite (blue-gray color) available from:
Chester Granite Company, 2200 Algerie Road, Blandford, MA 01008
Contact: Allen Williams, 413-269-4289, allen@chestergranite.com

B. Sizes shall be as shown on the Drawings.

C. Finish shall be:
Rock-faced at all exposed faces.
Sawn or thermal at unexposed faces.

2.8 NATURAL STONE BOULDERS

A. Natural Boulders and Vertical Stone Boulders shall be selected by the Commissioner.
1. Contractor shall be responsible for purchase, transportation and installation.
2. Vertical Stone boulders may require cutting to sizes required.

2.9 TREE FOSSILS

A. Tree Fossils shall be transported by Contractor from stockpile location within the Newtown Creek Wastewater Treatment Plant to the project area and installed on concrete bases as specified herein.
1. Contractor shall be responsible for transportation, installation and protection only.

2.10 METAL ITEMS

A. All steel framing, posts, roofs, supports and other items shall be galvanized steel with no additional coatings, complying with the requirements of Metal Fabrication: Section 055000.

2.11 ACCESSORIES

A. All anchors, dowels, fasteners and other hardware shall be stainless steel.

B. Setting buttons:
Lead or resilient plastic buttons, non-staining to stone, sized to suit joint thicknesses and bed depths of stonework without intruding into required depths of joint sealants or causing third-side adhesion between sealant and setting button.

C. Grout:
Non-shrink epoxy grout for dowels, anchors and other attachments shall be specifically intended for grouting metal into masonry. Submit proposed product as manufactured by Sika Corporation, Lyndhurst, NJ; ChemRex, Shakopee, MN or approved equal.

2.12 MORTAR AND GROUT MATERIALS

A. Portland Cement:
ASTM C150, Type I, except Type III may be used for cold weather construction. Provide gray or white cement as needed to produce mortar color required.

B. Hydrated Lime: ASTM C207, Type S.

C. Pointing Mortar Sand or Aggregate:
ASTM C144. Use aggregate graded with 100 per cent passing the No. 16 sieve.

D. White Mortar Aggregates:
Natural white sand or ground white stone.

E. Colored Mortar Aggregates:
Ground marble, granite, or other sound stone.

F. Mortar Pigments:
Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes.

G. Water: Clean, non-alkaline, and potable.

2.13 MORTAR MIXES

A. General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water-repellent agents, anti-freeze compounds, or calcium chloride, unless otherwise indicated.

B. Mixing:
Combine and thoroughly mix cementitious materials, water and aggregates in a mechanical batch mixer. Comply with referenced ASTM standard for mixing time and water content, unless otherwise indicated.

1. Use only enough water to produce a stiff mix that produces a moist surface at time stone is set.

C. Setting Mortar:
Mortar at all setting beds shall comply with ASTM C270, Type S, and shall consist of:
1 part Portland cement
1/2 part lime
4-1/2 parts sand

D. Pointing Mortar:
Pointing mortar at all visible joints shall comply with requirements indicated above for setting mortar, with additional pigments added to produce color to match approved sample.

1. Select and proportion pigments with other ingredients to produce color required.

2. Do not exceed pigment-to-cement ratio of 1 to 10, by weight.

2.14 EXPANSION JOINTS & SEALANTS

A. Expansion joint filler and sealant materials shall be as manufactured by:
Williams Products Inc, Troy, MI. Telephone (800) 521 9594.
Nomafoam, Zebulon, NC 27597. Telephone (800) 345-7279
Pecora Corp., Harleysville, PA 19438. Telephone (800) 523-6688.
Or Approved Equal.

1. Expansion joint filler shall be pre-molded non-bituminous material, compatible with backer rod and sealant, as "Polyurethane Foam 1320 Series" manufactured by Williams Products Inc., or approved equal.

2. Expansion joint backer rod material shall be closed cell polyethylene backer rod, as "Green-rod" manufactured by Nomafoam, or approved equal.

3. Expansion joint sealant at vertical surfaces shall two-part polyurethane rubber sealant, as "Dynatrol II", as manufactured by Pecora Corp., or approved equal.

4. Expansion joint sealant at horizontal surfaces shall two-part elastomeric polyurethane sealant, as "Dynatred", as manufactured by Pecora Corp., or approved equal.

5. Sealant colors shall be selected from full range of colors available.

PART III – EXECUTION

3.1 FABRICATION OF STEEL ITEMS

A. Fabrication shall comply with the requirements of Metal Fabrication: Section 055000.

B. Fabricate steel frameworks to dimensions shown on the Drawings.
   1. All welds shall be continuous, and ground smooth.

   2. All edges shall be ground smooth.

   3. Holes and slots for fasteners shall be correctly sized and located, and cleanly drilled, with edges ground smooth.

C. Clean and descale all surfaces and maintain in clean condition throughout the course of the contract.

D. All steel surfaces shall be hot-dipped galvanized, in accordance with the requirements of Metal Fabrication: Section 055000.

3.2 FABRICATION OF STONE ITEMS

A. Fabricate stonework to sizes, shapes and finishes shown on the Drawings.

B. Construction Tolerances:
Set stones to comply with the following tolerances:
   1. Vertical variation from plumb: Do not exceed 1/4 inch in 10 foot.

   2. Horizontal variation from level: Do not exceed 1/4 inch in 10 foot.

C. Fabricate work to produce stone shapes having a uniform profile throughout.

D. Field cutting:
Where field cutting is required, use skilled stone fitters, and use power saws to cut stones. For exposed edges, produce edges which are cut straight and true.

E. Finish exposed faces and edges of stones to comply with the requirements indicated herein and the approved sample submittals.
   1. Clean all sawn faces of stones to remove rust stains and iron particles.

F. Cut and drill sinkages and holes in stones for anchors, fasteners, supports and lifting devices as shown on the Drawings, or as required to set stonework securely in place.
   1. Install anchors, supports, fasteners and other attachments indicated or necessary to secure stonework in place.

   2. Shim and adjust anchors, supports and accessories to set stones accurately in locations indicated, with uniform joints of widths indicated, and with edges and faces aligned according to established relationships and indicated tolerances.

G. Provide chases, reveals, openings or other features as required to accommodate contiguous work.
   1. Close up openings in stonework after other work is in place with stonework which

matches that already set.

3.3 INSTALLATION OF STONEWORK - GENERAL

A. All items shall be pre-fabricated to the greatest extent possible prior to installation.

B. Verify exact locations furnishings.
   1. Stake out locations of all furnishings for approval prior to installation of concrete footings for furnishings.
   2. Revise locations as directed, to satisfaction of Commissioner.
   3. Coordinate with fabricator to provide templates to insure the precise locations of footings

C. Poured in place concrete footings shall be installed to sizes shown on the Drawings, in accordance with Section 033000.

D. Verify footing placement to correct line and grade and with correct finish, prior to installation of anchors, dowel or mortar beds.

E. Attach furnishings to concrete footings with fastenings as shown on Drawings.
   1. Shim as required using concealed non-corrosive structural shims.
   2. Cut all protruding bolt ends flush with nuts and peen over.
   3. All furnishings shall stand plumb and level after installation, with no possible rocking or other movement, and with a maximum tolerance of 1/8 inch per foot horizontally and vertically.

3.4 INSTALLATION OF STONE ITEMS ON CONCRETE FOOTINGS

A. Before starting installation, the concrete footing surface shall be cleaned to remove dirt, dust, debris, solid and loose mortar. Do not begin stone setting work until unsatisfactory conditions have been corrected and substrate is ready to receive furnishings.
   1. Saturate concrete footing with clean water several hours before placing mortar setting beds.
   2. Remove surface water approximately one (1) hour prior to placing mortar setting bed.

B. Anchors:
   1. Where shown on the Drawings set stainless steel dowels into pre-formed holes in the concrete sub-base and grout with non-shrink grout.
   2. Allow to set before proceeding with work.

C. Mortar Setting Bed:

1. Apply slush coat of mortar to a maximum thickness of 1/16" over surface of concrete just prior to placing setting bed.

2. Limit area of application to avoid drying out prior to placement of setting bed.

3. Place and shape mortar setting bed to uniform thickness, typically 3/4 inch minimum, or as required for accurate setting of stones to finish grades indicated.

4. Mix and place only that amount of mortar which can be covered with stone prior to initial set.

5. Screed setting mortar level.

D. Setting:

1. Prior to setting, all stones shall be clean and free from stain, dirt, or dust.

2. If necessary, scrub face with mild soap and clean water applied with stiff fiber brushes. Rinse well with clean water.

3. Wet stones thoroughly before setting.

4. Check that holes for dowels or other anchors are correctly located before proceeding to set stones.

5. Fill holes for dowels or anchors with non-shrink grout.

6. Provide shims or setting buttons as required to support stone prior to setting of mortar bed.

7. Set stones before initial set of mortar bed and non-shrink grout occurs.

8. Do not set stone on dry bed.

9. Apply 1/16 inch thick slurry bond coat of mortar to bed with a flat trowel immediately prior to placing stones on green or wet setting bed.

10. Apply skim coat of same material as slurry bond coat to bottom of stones immediately before placement.

11. Tamp or beat stones to obtain full contact and adhesion with setting bed.

12. Set and level each stone immediately, prior to initial set of mortar.

13. Do not return to areas already set and disturb stones for leveling purposes.

E. Anchor Bolts:
1. Provide anchor bolts as shown on the Drawings and specified herein.

2. Install epoxy adhesive system in strict accordance with manufacturer's instructions.

3. Provide temporary support systems as required prior to full set of adhesive system.

F. Mortar Joints:
1. Set stone with maximum joint width of 1/2".

2. Fill joints with pointing mortar; forcing mortar into joints, taking care not to smear adjoining exposed stone surfaces.

3. Tool joint surfaces to concave profile, using non-metallic tooling rod.

4. Cure mortar by maintaining in damp condition for 7 days.

G. Expansion Joints:
1. Provide expansion joints where stone units abut other constructions and at all locations shown on the Drawings. Do not fill with mortar.

2. Install continuous strips of preformed joint filler. The joint filler material shall be brought to within 3/4-inch of the finished surface of the concrete.

3. After curing the joint shall be filled with approved backer rod and two-part urethane sealant in approved color.

4. Sealant shall be recessed 1/8-inch from finished surface of stone.

3.5 STONE TABLE & BENCHES

A. Fabricate steel framework to dimensions shown on the Drawings. Weld all joints and grind smooth. Comply with the requirements of Section 055000: Metal Fabrications.

B. After fabrication galvanize entire framework for tables and benches, in accordance with the requirements of Section 055000: Metal Fabrications.

C. Install steel frameworks on concrete footings, as shown on the Drawings.

D. Prepare stone table top and bench top prior to attachment to framework. Clean surfaces to remove all dirt and grease, or other materials, using mild non-corrosive materials and brushes.

E. Apply adhesive to top surface of steel framework, and to stone surface, in strict accordance with the manufacturer's instructions.
1. Adhesive shall completely cover all surfaces to be joined.

F. Position stone bench or table top over frame and adjust location to conform to dimensions shown on Drawings.
   1. Ensure all stone surfaces are in contact with framework, and beat stone as required to ensure full contact of adhesive between stone and steel.
   2. Provide temporary clamping or other methods to secure stone top in place until adhesive is fully set.
   3. Allow to set in full compliance with manufacturer's instructions before removal of temporary clamping.

3.6 ETCHING AT STONE TABLE

A. Graphics and lettering shall be etched into faces of stone table in the shop.
   1. Etching shall be by sandblasting with template or other method as previously approved.
   2. Etching shall be to a depth of 3/16 to 1/4 inch, or as shown on the Drawings.
   3. All cuts shall be clean and straight.

3.7 INSTALLATION OF STONE BOULDERS

A. Boulders shall be installed only in the presence of the Commissioner.

B. In coordination with Commissioner select flat face of boulder for base. If no suitable flat face is present, provide suitable base face by splitting or saw cutting stone.

C. In coordination with Commissioner determine depth of bury for each boulder, and excavate and provide concrete footing at correct elevation for depth of bury.

D. Boulder installation:
   1. Place the boulders in position and orientation as directed by the Commissioner.
   2. Install on concrete footings as described in section 3.4 herein.

3.8 INSTALLATION OF TREE FOSSLIS

A. Tree Fossils are over 300 million years old and shall be handled with extreme care to avoid chipping or any other damage.

B. Tree Fossils shall be installed only in the presence of the Commissioner.

C. Tree Fossil installation:
   1. Place the fossils in position and orientation as directed by the Commissioner.

2. Install on concrete footings as described in section 3.4 herein.

3.9 PROTECTION

A. Protect all stonework from damage during the course of the contract.
   1. Provide all temporary protection measures or barricades as required to protect all items.

   2. Cover partially completed items when work is not in progress. Hold covers securely in place.

   3. Prevent staining of all items by mortar, or other sources; immediately remove all stains without damage to items.

3.10 ADJUSTMENTS

A. Replace or repair defective, broken or damaged items or system components, including but not limited to the following defects:
   1. Items not matching approved shop drawings or samples.
   2. Broken, chipped, stained, or otherwise damaged items.
   3. Uneven settling, or other evidence of improper installation.
   4. All other defects as directed by the Commissioner.

3.11 CLEAN-UP

A. After all items are thoroughly set, clean to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.

B. After completion of the work, the Contractor shall remove all temporary protective measures and temporary identification numbers, and clean all items as necessary.

C. After completion of the work, the Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

END OF SECTION

SECTION 32 40 20
WOOD FURNISHINGS

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of custom fabricated wood site furnishings, including:
      a. Timber Seats
      b. Wood seats at Stone & Wood Seating
      c. Wood seats at Benches with Shade Roofs
      d. Wood planting edging at planting beds.

   2. Supply and installation of metal bases and frames, fasteners and all incidental materials and equipment necessary to complete the work of this Section.

1.3 RELATED WORK

A. Cast-in-Place Concrete: Section 03 30 00

B. Metal Fabrications: Section 05 50 00

C. Excavation – Earth and Rock: Section 31 23 16

D. Backfilling: Section 31 23 23

E. Stone Paving: Section 32 14 20

F. Stonework: Section 32 40 10

G. Site Furnishings: Section 32 40 30

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Shop Drawings:
Submit complete and dimensioned layout drawings, including dimensioned locations of all

anchors and joints for each item specified herein.

C. Samples - Wood:
Samples will be reviewed for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
1. Wood samples for each type of wood specified herein.

2. Clearly mark samples to show finished face.

D. Samples - Metal:
Samples will be reviewed for finish only. Compliance with all other requirements is the responsibility of the Contractor.
1. Metal samples for each type of metal specified herein.

2. Clearly mark samples to show finished face.

E. Material Certificates and Test Results:
1. For preservative-treated wood products indicate type of preservative used and net amount of preservative retained.

2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment.

1.5 DELIVERY, STORAGE & HANDLING

A. Deliver all materials to project site in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

B. Store materials at a minimum temperature of 20 degrees F and a maximum temperature of 100 degrees F

C. Store wood and metal items on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage or cracking, and to allow air circulation.

1.6 ENVIRONMENTAL CONDITIONS

A. Cold Weather Protection:
Comply with the following requirements:
1. Do not use frozen materials or materials mixed or coated with ice or frost.

2. Do not build on frozen subgrade or setting beds.

3. Remove and replace work damaged by frost or freezing.

PART II - PRODUCTS

2.01 WOOD ITEMS - GENERAL

A. All wood items shall comply with DOC PS 20 and with applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by ALSC's Board of Review.
   1. Provide lumber graded by an agency certified by ALSC's Board of Review to inspect and grade lumber under the rules indicated.
   2. Factory mark each item with grade stamp of grading agency.
   3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified.
   4. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
   5. Provide dressed lumber, S4S, unless otherwise indicated.
   6. Maximum Moisture Content: 19 percent

B. Provide material hand selected for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane

C. All wood units or slats shall be milled perfectly smooth to the finished length.
   1. All milled surfaces shall be sanded smooth on all four sides and both ends after being worked to the required dimensions.
   2. All edges shall be eased to a radius of one-eighth inch (1/8").
   3. Each unit or slat shall be of one continuous piece; no joints will be allowed.

2.2 WOOD SPECIES

A. Wood slats at covered benches shall consist of:
   Black Locust (Robinia pseudoacacia) FAS grade or equivalent, untreated, complying with National Hardwood Lumber Association (NHLA) grading rules shall apply.
   Available from:
   1. Trees Unlimited Recycled Forest Products, Pownal, VT
   2. Suburban Mills, Huntington, NY
   3. New England Naval Timbers, LLC, Collinsville, CT
   4. Or approved equal.

B. All other lumber shall be construction or No. 2 grade and any of the following species:

1. Hem-fir or hem-fir (North); NLGA, WCLIB, or WWPA.

2. Douglas fir-larch, Douglas fir-larch (North), or Douglas fir-south; NLGA, WCLIB, or WWPA.

3. Mixed southern pine; SPIB.

4. Spruce-pine-fir or spruce-pine-fir (South); NeLMA, NLGA, WCLIB, or WWPA.

C. Preservative Treatment:
Pressure treat all lumber except Black Locust with waterborne preservative according to AWPA C15 requirements for "sawn building poles and posts as structural members."
1. Do not use chemicals containing arsenic or chromium

2. Use process that includes water-repellent treatment.

3. After treatment lumber shall not exceed 19 percent moisture content.

4. Mark treated wood with treatment quality mark of an inspection agency approved by ALSC's Board of Review.

5. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber. Use copper naphthenate at cut surfaces.

2.3 HARDWARE

A. All fasteners and other hardware shall be stainless steel.

2.4 METAL ITEMS

A. All steel supports and other items shall be galvanized steel with no additional coatings, complying with the requirements of Metal Fabrication: Section 055000.

2.5 CONCRETE

A. All concrete shall comply with the requirements of Cast In Place Concrete: Section 033000.

2.6 WOOD PLANTING EDGE

A. Wood shall be as specified herein. Each edging section shall be a single monolithic wood unit. Wood infill wedges shall match wood edge, with each wedge a single monolithic unit.

B. Sizes shall be as shown on the Drawings.

2.7 CUSTOM FABRICATED TIMBER SEATS

A. Wood for seats shall be as specified herein.

B. Framework shall be fabricated from hot-dipped galvanized steel channel, sizes as shown on the drawings,

2.8 CUSTOM FABRICATED SEATS AT STONE & WOOD BENCHES

A. Wood for seat shall be as specified herein. Seat shall be a single monolithic wood unit.

B. Stone for seat back shall be as specified in Section 324010 - Stonework.

C. Steel frame shall hot-dipped galvanized, sizes as shown on the drawings.

2.9 CUSTOM FABRICATED COVERED BENCHES

A. Framework and roof shall be as specified in Section 324030 – Site Furnishings.

B. Wood for seat slats shall be as specified herein. Wood slat sizes shall be as shown on the Drawings.

PART III - EXECUTION

3.1 FABRICATION OF WOOD ITEMS

A. Fabricate wood to sizes, shapes and finishes shown on the drawings.

B. Construction Tolerances:
Set wood to comply with the following tolerances:
1. Vertical variation from plumb: Do not exceed 1/4 inch in 10 foot.

2. Horizontal variation from level: Do not exceed 1/4 inch in 10 foot.

C. Fabricate work to produce wood shapes having a uniform profile throughout.
1. Drill out timbers to dimensions shown on drawing.

2. Sand all edges smooth.

D. Sort and select lumber so that natural characteristics will 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.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use copper naphthenate at cut surfaces.

3.2 FABRICATION OF STEEL ITEMS

A. Fabrication shall comply with the requirements of Metal Fabrication: Section 055000.

B. Fabricate steel frameworks to dimensions shown on the drawings.
   1. All welds shall be continuous, and ground smooth.
   2. All edges shall be ground smooth.
   3. Holes and slots for fasteners shall be correctly sized and located, and cleanly drilled, with edges ground smooth.

C. Clean and descale all surfaces and maintain in clean condition throughout the course of the contract.

D. All steel surfaces shall be hot-dipped galvanized, in accordance with the requirements of Metal Fabrication: Section 055000.

3.3 INSTALLATION - GENERAL

A. All items shall be pre-fabricated to the greatest extent possible prior to installation.

B. Verify exact locations.
   1. Stake out locations for approval by Commissioner prior to installation of concrete footings.
   2. Revise locations as directed to satisfaction of Commissioner.
   3. Coordinate with fabricator to provide templates to insure the precise locations of footings.

C. Poured in place concrete footings shall be installed to sizes shown on the drawings, in accordance with Section 033000.

D. Verify footing placement to correct line and grade and with correct finish, prior to installation of anchors, dowel or mortar beds.

E. Attach items to concrete footings with fastenings as shown on drawings.
   1. Shim as required using concealed non-corrosive structural shims.
   2. Cut all protruding bolt ends flush with nuts and peen over.
   3. All furnishings shall stand plumb and level after installation, with no possible rocking or other movement, and with a maximum tolerance of 1/8 inch per foot

horizontally and vertically.

3.4 INSTALLATION OF WOOD ITEMS

A. Secure wood to framework with fasteners as shown on the drawings.
   1. Cut all protruding bolt ends flush with nuts and weld end. Grind ends smooth.

B. Sand all wood faces and edges smooth. Apply approved preservative treatment to wood in accordance with manufacturer's instructions.

3.5 PROTECTION

A. Protect all items from damage during the course of the contract.
   1. Provide all temporary protection measures or barricades as required to protect all items.

   2. Cover partially completed items when work is not in progress. Hold covers securely in place.

   3. Prevent staining of all items by mortar, or other sources; immediately remove all stains without damage to items.

3.6 ADJUSTMENTS

A. Replace or repair defective, broken or damaged items or system components, including but not limited to the following defects:
   1. Items not matching approved shop drawings or samples.
   2. Broken, chipped, stained, or otherwise damaged items.
   3. Uneven settling, or other evidence of improper installation.
   4. All other defects as directed by the Commissioner.

3.7 CLEAN-UP

A. After all items are thoroughly set, clean to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.

B. After completion of the work, the Contractor shall remove all temporary protective measures and temporary identification numbers, and clean all items as necessary.

C. After completion of the work, the Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

END OF SECTION

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SECTION 32 40 30
SITE FURNISHINGS

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of custom fabricated stone, wood and metal site furnishings, including:
      a. Steel pipe seats
      b. Steel pipe post for PV battery
      c. Steel trash receptacle
      d. Steel footbridge
      e. Bench with shade roof

   2. Supply and installation of bike racks.

   3. Supply and installation of concrete bases, dowels, fasteners and all incidental materials and equipment necessary to complete the work of this Section.

1.3 RELATED WORK

A. Cast-in-Place Concrete: Section 03 30 00

B. Structural Steel Framing: Section 05 12 00

C. Metal Fabrications: Section 05 50 00

D. Lighting: Section 26 50 00

E. Exterior Lighting: Section 26 56 00

F. Excavation – Earth and Rock: Section 31 23 16

G. Stone Paving: Section 32 14 20

H. Stonework: Section 32 40 10

I. Wood Furnishings: Section 32 40 20

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Catalog Cuts:
Submit manufacturer's product data for the following items:
1. Bike Rack

C. Product Data:
Submit the manufacturer's product data for steel gratings, including load tables, anchor details and standard installation details.

D. Shop Drawings:
Submit complete and dimensioned fabrication drawings, including plans, elevations, sections and details. Show connection details including type and location of all fasteners, for the following items:
1. Steel pipe seats
2. Steel pipe star lights
3. Steel pipe post for PV battery
4. Steel trash receptacle
5. Steel footbridge
6. Bench with shade roof
7. Bench with shade roof and PV panel

E. Samples - Metal:
Samples will be reviewed for finish only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
1. Metal samples for each type of metal specified herein.
2. Clearly mark samples to show finished face.

F. Samples of steel grating for bridge deck.

1.5 REFERENCES – STEEL GRATING

A. ASTM A-1011 CS Type B Steel Strip Hot-Rolled Carbon

B. ASTM A-513 Carbon Steel Mechanical Tubing

C. ANSI/NAAMM- MBG-531-09 Metal Bar Grating Manual

1.6 DELIVERY, STORAGE & HANDLING

A. Deliver all materials to project site in undamaged condition. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

B. Store materials at a minimum temperature of 20 degrees F and a maximum temperature of 100 degrees F.

C. Store cementitious materials off the ground, under cover and in a dry location.

D. Store stone, wood and metal items on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and pavers to distribute weight evenly and to prevent breakage or cracking, and to allow air circulation.

1.7 ENVIRONMENTAL CONDITIONS

A. Cold Weather Protection:
Comply with the following requirements:
1. Do not use frozen materials or materials mixed or coated with ice or frost.

2. Do not build on frozen subgrade or setting beds.

3. Remove and replace work damaged by frost or freezing.

PART II - PRODUCTS

2.1 METAL ITEMS - GENERAL

A. All steel framing, posts, roofs, supports and other items shall be galvanized steel with no additional coatings, complying with the requirements of Metal Fabrications: Section 055000.

2.2 WOOD ITEMS - GENERAL

A. All wood items shall comply with Wood Furnishings: Section 324020.

2.3 STONE ITEMS - GENERAL

A. All stone shall comply with Stonework: Section 324010.

2.4 CONCRETE

A. All concrete shall comply with the requirements of Cast In Place Concrete: Section 033000.

2.5 HARDWARE

A. All fasteners and other hardware shall be stainless steel.

B. Z-Bracket for PV Panel attachment at shade roof shall be galvanized.

2.6 BIKE RACK

A. Bike Racks shall be NYC DOT standard "CityRack" with in-ground anchoring. Rack shall consist of 33.7-inch-diameter, contoured cast-metal circle with a horizontal bar across the center.

2.7 CUSTOM FABRICATED PIPE SEAT & STAR LIGHTS

A. Pipe seats shall fabricated from hot-dipped galvanized steel pipes and plates, sizes as shown on the Drawings

B. Star Lights shall fabricated from hot-dipped galvanized steel pipes, plates and angles, sizes as shown on the Drawings.
   1. Light top shall be fabricated from clear laminated safety glass with support brackets and retainer ring as shown on the Drawings.
   2. Glass shall be etched with text (star names). Commissioner will provide full-size templates for text and layout at each glass top.
   3. Lighting insert shall consist of polished stainless steel drop-in canister with five LED lights. Lights and wiring shall conform to Section 265000-Lighting.
   4. Commissioner will provide full-size templates for layout of LED lights at each canister.

2.8 CUSTOM FABRICATED SUPPORT POST FOR PV BATTERY

A. Post shall fabricated from steel pipe, steel plate end cap and base plate, sizes as shown on the Drawings.
   1. Post shall be hot-dipped galvanized after fabrication.

B. Provide access handhole and NPS fitting for wiring connections as shown on the Drawings. Handhole shall be secured to post with vandal-proof screws.

C. Battery, enclosure and wiring shall be as specified under Section 265000-Lighting. Secure battery enclosure to post with stainless steel U-bolts.

2.9 CUSTOM FABRICATED TRASH RECEPTACLE

A. Trash receptacle and cover shall be fabricated from steel tubes, angles and plates, sizes as shown on the Drawings,
   1. Trash receptacle shall be hot-dipped galvanized after fabrication.

2.10 CUSTOM FABRICATED BENCH WITH SHADE ROOF

A. Galvanized steel framework and roof shall be fabricated from steel tubes, angles, bars and plates, sizes as shown on the Drawings.

1. Steel framework, roof, seat support angles and other metal elements shall comply with the requirements of Metal Fabrication: Section 055000.

B. Wood for seat slats shall be as specified in Section 324020.

C. For units with PV Panel, provide access handhole and NPS fitting for wiring connections at post as shown on the Drawings. Handhole shall be secured to post with vandal-proof screws.

D. Battery, enclosure and wiring shall be as specified under Section 265000-Lighting. Secure battery enclosure to post with stainless steel U-bolts.

2.11 CUSTOM FABRICATED FOOTBRIDGE

A. Stone ramps shall comply with the requirements of Stonework: Section 324010.

B. Galvanized steel framework, posts, rails and other support elements shall comply with the requirements of Metal Fabrications: Section 055000.

C. Deck gratings shall be ADA-compliant close-mesh, Carbon Steel Swage Lock Rectangular Bar Grating type 7-SGCS-4 fabricated by assembling tubular steel cross bars through round shaped holes in rectangular bearing bars that are then permanently locked in place by swaging, as manufactured by:
Ohio Gratings Inc. 5299 Southway St. SW, Canton, OH 44706, 800-321-9800
www.ohiogratings.com , or approved equal.

D. Deck grating fabrication tolerances shall be in accordance with applicable provisions and recommendations of ANSI/NAAMM 531-09 Metal Bar Grating Manual, and shall comply with the following requirements:

1.	Bearing bars and banding:	Carbon Steel type ASTM A-1011 CS Type B
2.	Steel Tube Cross Bars:	Type ASTM A-513.
3.	Finish:	Hot-dip galvanized per ASTM A123
4.	Bearing Bar Spacing:	7/16" on center.
5.	Bearing Bar Depth:	based on loading requirements and clear span.
6.	Bearing Bar Thickness:	3/16" space between bars.
7.	Cross Bar Spacing:	4" on center.
8.	Top Surface of Bearing Bars:	Slip Resistant Surface

E. Steel Grating Design Criteria:
1. Loading: Grating Products shall be designed and manufactured to meet the live load conditions of 100 lbs/ Sq Ft with maximum deflection of 1/4" for the clear spans shown on the drawings. Bearing bar depth shall be as shown on the contract drawings or as recommended by the manufacturer to meet the loading requirements, clear span conditions and maximum deflections specified.

2. Slip Resistance: Walking Surfaces shall have a minimum slip resistant coefficient of friction (COF) of 0.8 to meet Americans with Disabilities Act (ADA) guidelines of COF = 0.6 for level surfaces and 0.8 for ramps.

F. Steel Grating Fabrication:
Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings. Band ends and cuts in grating with bars of same size and material as bearing bars.

PART III - EXECUTION

3.1 FABRICATION OF STEEL ITEMS

A. Fabrication shall comply with the requirements of Metal Fabrication: Section 055000.

B. Fabricate steel frameworks to dimensions shown on the Drawings.
1. All welds shall be continuous, and ground smooth.

2. All edges shall be ground smooth.

3. Holes and slots for fasteners shall be correctly sized and located, and cleanly drilled, with edges ground smooth.

C. Clean and descale all surfaces and maintain in clean condition throughout the course of the contract.

D. All steel surfaces shall be hot-dipped galvanized, in accordance with the requirements of Metal Fabrications: Section 055000.
1. Galvanize after fabrication to the greatest extent possible.

3.2 STEEL GRATING BRIDGE DECK

A. Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG-531-09 Metal Bar Grating Manual.

B. Grating Attachment: Use approved attachment system and fasteners to secure grating to supporting members as shown on the Drawings.

3.3 INSTALLATION OF SITE FURNISHINGS - GENERAL

A. All furnishings shall be pre-fabricated to the greatest extent possible prior to installation.

B. Verify exact locations furnishings.
1. Stake out locations of all furnishings for approval prior to installation of concrete footings for furnishings.

2. Revise locations as directed to satisfaction of Commissioner.

3. Coordinate with fabricator to provide templates to insure the precise locations of footings.

C. Poured in place concrete footings shall be installed to sizes shown on the Drawings, in accordance with Section 033000.

D. Verify footing placement to correct line and grade and with correct finish, prior to installation of anchors, dowel or mortar beds.

E. Attach furnishings to concrete footings with fastenings as shown on Drawings.
1. Shim as required using concealed non-corrosive structural shims.

2. Cut all protruding bolt ends flush with nuts and peen over.

3. All furnishings shall stand plumb and level after installation, with no possible rocking or other movement, and with a maximum tolerance of 1/8 inch per foot horizontally and vertically.

3.4 PROTECTION

A. Protect all items from damage during the course of the contract.
1. Provide all temporary protection measures or barricades as required to protect all items.

2. Cover partially completed items when work is not in progress. Hold covers securely in place.

3. Prevent staining of all items by mortar, or other sources; immediately remove all stains without damage to items.

3.5 ADJUSTMENTS

A. Replace or repair defective, broken or damaged items or system components, including but not limited to the following defects:
1. Items not matching approved shop drawings or samples.

2. Broken, chipped, stained, or otherwise damaged items.

3. Uneven settling, or other evidence of improper installation.

4. All other defects as directed by the Commissioner.

3.6 CLEAN-UP

A. After all items are thoroughly set, clean to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.

B. After completion of the work, the Contractor shall remove all temporary protective measures and temporary identification numbers, and clean all items as necessary.

C. After completion of the work, the Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

END OF SECTION

SECTION 32 40 50
SIGNAGE

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.

1.2 SUMMARY

A. This work includes but is not limited to the following:
   1. Supply and installation of custom fabricated stainless steel signs and plaques as shown on the Drawings.

   2. Supply and installation of custom fabricated sign posts and supports as shown on the Drawings.

   3. Supply and installation of concrete bases, dowels, fasteners and all incidental materials and equipment necessary to complete the work of this Section.

1.3 RELATED WORK

A. Cast-in-Place Concrete: Section 03 30 00

B. Metal Fabrications: Section 05 50 00

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Full-size layouts of graphics and lettering for each different sign will be provided to Contractor in digital format.

C. Shop Drawings:
Submit complete and dimensioned drawings, including dimensioned locations of all anchors for the following items:
   1. Stainless Steel Signs

D. Samples:
Submit samples of stainless steel signs, to show material, finish, example of etched lettering and graphics.
   1. Samples shall be a minimum of 3" x 6" x 3/16" thick.

2. Submit sample to show lettering. Lettering shall be of sizes and fonts as specified for actual work.

3. Submit sample to show graphics. Graphics may differ from actual work, but shall include both straight and curved lines similar in thickness and complexity to actual work.

1.5 PRODUCT HANDLING

A. All items shall be delivered to site in finished condition, undamaged and ready to be installed at locations shown on the Drawings.

B. Use all means necessary to protect the materials of this section before, during, and after construction.

PART II - PRODUCTS

2.1 STAINLESS STEEL SIGNS & PLAQUES

A. All custom-fabricated stainless steel signs shall be constructed of stainless steel plates of the sizes shown on the Drawings.
   1. All material shall be Type 316 stainless steel.
   2. Finish shall be No.2D sheet finish, annealed, pickled and cold rolled.
   3. Stainless steel work shall conform to the requirements of Metal Fabrications: Section 055000.

B. Lettering and graphic work will be provided to fabricator at full size. Using these layouts, fabricator will etch surface of stainless steel plates to a depth of 3/32 inch or as shown on the Drawings.
   1. All etched text and graphics shall be black-filled.

C. Fabricate all steelwork to dimensions shown on the Drawings.
   1. All welds shall be continuous, and ground smooth.
   2. All edges shall be ground smooth.
   3. Holes and slots for fasteners shall be correctly sized and located, and cleanly drilled, with edges ground smooth

2.2 HARDWARE

A. All fasteners, straps, clamps and other hardware shall be Type 316 stainless steel.

2.3 ADHESIVE

A. Epoxy adhesive shall be:
   1. 3M Scotch-Weld Epoxy Adhesive Type DP100 Clear
   2. Devcon 14240 5-Minute Epoxy Gel.
   3. Or approved equal

2.4 CONCRETE FOOTINGS

A. All concrete shall comply with the requirements of Cast In Place Concrete: Section 033000.

2.5 ENTRANCE SIGN

A. Sign shall consist of etched stainless steel plate and stainless steel self tapping screws with vandal-proof heads.

2.6 SOIL BORING SIGN

A. Sign shall consist of etched stainless steel plate bent and welded to triangular shape as shown on the Drawings.

B. Sign post and sleeve shall stainless steel pipes as shown on the Drawings.

2.7 INFORMATION SIGN

A. Sign plaques shall consist of etched stainless steel plates as shown on the Drawings.

B. Sign support shall consist of dowel and welded plate as shown on the Drawings.
   1. Signs shall be adhered to support plates with epoxy adhesive.

2.8 INFORMATION PLAQUES

A. Sign plaques shall consist of etched stainless steel plates with welded anchor dowels as shown on the Drawings.

B. Plaques shall be anchored to concrete base flush with finished grade.

PART III - EXECUTION

3.1 INSTALLATION OF SIGNS - GENERAL

A. All signs shall be pre-fabricated to the greatest extent possible prior to installation.

B. Verify exact locations of each sign.
   1. Stake out locations for approval by Commissioner prior to installation of concrete

footings, or drilling at fence.

C. Signs shall stand truly vertical and level after installation.

3.2 INSTALLATION OF ENTRANCE SIGN AT FENCE

A. Secure Entrance Sign to stainless steel fence at location shown on the Drawings.

B. Self tapping screws shall be used to secure sign to fence pickets.
   1. Screws shall not penetrate beyond center of pickets.
   2. Use EPMD washers between sign and fence picket.

C. Top edge of sign shall be at true horizontal level after installation, with no warping or skewing.

3.3 INSTALLATION OF SIGNS ON POSTS

A. Poured in place concrete footings shall be installed to sizes shown on the Drawings, in accordance with Section 033000.

B. Install sign posts in concrete footings as shown on Drawings. All posts shall stand plumb and level after installation, with no possible rocking or other movement.

3.4 INSTALLATION OF SIGNS AT GRADE

A. Poured in place concrete footings shall be installed to sizes shown on the Drawings, in accordance with Section 033000.

B. Install sign plaque on concrete base as shown on Drawings. Plaques shall be flush with surrounding pavement after installation with no tripping hazards.

3.5 PROTECTION

A. Protect all items from damage during the course of the contract.
   1. Provide all temporary protection measures or barricades as required to protect all items.
   2. Cover items with non-staining waterproof sheeting at end of each day's work. Hold covers securely in place.
   4. Prevent staining of items by mortar, or other sources. Immediately remove such all stains without damage to items.

3.6 ADJUSTMENTS

A. Replace or repair defective, broken or damaged items or system components, including but not limited to the following defects:
   1. Items not matching approved shop Drawings or samples.
   2. Broken, chipped, stained, or otherwise damaged items.

3. Uneven settling, or other evidence of improper installation.
4. All other defects as directed by the Commissioner.

3.7 CLEAN-UP

A. After all items are thoroughly set, clean to remove all mortar or other stains, using mild non-corrosive materials and brushes. All surrounding paving materials or other structures shall be cleaned of all mortar or other stains.

B. After completion of the work, the Contractor shall remove all temporary protective measures and temporary identification numbers, and clean all items as necessary.

C. After completion of the work, the Contractor shall remove all debris or excess materials, restore all damaged areas and leave the area in a clean state acceptable to the Commissioner.

3.8 PROTECTION

A. The Contractor shall protect all items of this Section during the life of this contract until final acceptance of the work, and shall repair and replace all work that are disturbed, damaged, or destroyed at no cost to the Commissioner.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 32 84 00
IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS.

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Piping.
2. Sleeving for piping.
3. Manual valves.
4. Automatic control valves.
5. Drip equipment.
6. Quick couplers.
7. Controllers.
8. Boxes for automatic control valves.
9. Wiring and connections.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.4 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic operation with controller and automatic control valves.

B. Water Supply: 1" municipal supply at 60 psi minimum, by others.

C. Power Supply: 115 Vac dedicated outlet with 20 amp breaker, by others.

D. Location of Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent irrigation coverage of areas indicated.

E. Provide for 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

F. Sleeving and conduit, by others.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Engineering Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Coordination Drawings: Irrigation systems, drawn to scale, on which components are shown and coordinated with each other, using input from Installers of the items involved. Also include adjustments necessary to avoid plantings and obstructions such as signs and light standards.

D. Qualification Data: For qualified Installer.

E. Field quality-control reports.

F. Operation and Maintenance Data: Include operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: The contractor or subcontractor performing the work of this section must within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work. In addition, the installer must be a Certified Irrigation Contractor qualified by The Irrigation Association.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Commissioner no fewer than two days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Commissioner's written permission.

1.9 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. 100' dripperline and 5 fittings each
2. Automatic Control Valves: 1 extra of each
3. Keys and hose attachment for quick couplers: 1 of each.
4. Keys to controller cabinet: 2

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. Soft Copper Tube: ASTM B 88, Type L for aboveground installation and type 'K' for underground installation.

1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

C. PVC Pipe: ASTM D 1785, PVC 1120 compound, SDR 21, Class 200.

1. PVC Socket Fittings: ASTM D 2466, Schedule 40.
2. PVC Threaded Fittings: ASTM D 2464, Schedule 80.

D. Poly Pipe: ASTM D2239, 100 PSI.

1. Insert Fittings & Saddles

E. Dripperline: 0.6 GPH, 12 in. spacing.

2.2 PIPING JOINING MATERIALS

A. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

E. Ear clamps for insert fittings for Poly Pipe

2.3 SLEEVING FOR PIPING

A. Standard: Schedule 40 PVC Pipe.

2.4 MANUAL VALVES

A. PVC Ball Valves:

1. Manufacturers:

   a. Dura Plastics.
   b. NIBCO INC.
   c. Lasco, Inc.
   d. Or approved equal.

2. Description:
   a. CWP Rating: 200 psig (1380 kPa).
   b. Body Material: Schedule 80 PVC
   c. Ends: Threaded or solder joint.

2.5 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves:

1. Manufacturers:
   a. Hunter Industries Incorporated.
   b. Rain Bird Corporation.
   c. Toro Company (The); Irrigation Division.
   d. Or approved equal

2. Description: Molded-plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.6 QUICK COUPLERS

A. Manufacturers:

1. Buckner; a division of Storm Manufacturing Group Inc.
2. Hunter Industries Incorporated.
3. Rain Bird Corporation.
4. Toro Company (The); Irrigation Division.
5. Or approved equal

B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

1. Include one matching key.

2.7 CONTROLLERS

A. Manufacturers:
   1. Hunter Industries Incorporated.
   2. Rain Bird Corporation.
   3. Toro Company (The); Irrigation Division.
   4. Or approved equal

B. Description:

   1. Controller Stations for Automatic Control Valves. Include switch for manual or automatic operation of each station.

   2. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two matching keys; include provision for grounding.

      a. Body Material Molded plastic.
      b. Mounting: Surface type for wall.

   3. Control Transformer: 24-V secondary, with primary fuse.

   4. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.

      a. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
      b. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.
      c. Surge Protection: Metal-oxide-varistor type on each station and primary power.

   5. Solar Sync Sensor of same manufacturer as Controller.
      a. Wireless Solar Sync downward facing antenna and receiver.
      b. Wall bracket for antenna and wall bracket for receiver.

   6. Wiring: UL 493, Type UF #18 gauge multi sable, with solid-copper conductors; insulated cable; suitable for direct burial.
      a. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

2.8 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:

1. Manufacturers:

   a. Armorcast Products Company.
   b. Carson Industries LLC.
   c. Orbit Irrigation Products, Inc.
   d. Dura Plastics.
   e. Or approved equal.

2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.

   a. Size: As required for valves and service.
   b. Shape: Rectangular.
   c. Sidewall Material: PE.
   d. Cover Material: PE.

      1) Lettering: "IRRIGATION."

2.9 IRRIGATION BOOSTER PUMP

A. Pump basis of design shall be "Alyan Pump", Type "PP" water pressure booster system, or approved equal manufacturer. Model as indicated on the contract drawings or approved equal.

B. Manufacturers:

1. Rainbird, Model LC 750;

2. Davey, Model BT20-30;

3. Alyan Pumps, PP series;

4. Or approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312316 and Section 312323.

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 12 inches below finished grade
2. Circuit Piping: 8 inches
3. Sleeves: 24 inches

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Commissioner's approval before excavation.

3.3 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.

B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install underground thermoplastic piping according to ASTM D 2774 and ASTM F 690.

G. Install expansion loops in control-valve boxes for plastic piping.

H. Lay piping on solid subbase, uniformly sloped without humps or depressions.

I. Install PVC piping in dry weather when temperature is above 40 deg F (5 deg C). Allow joints to cure at least 24 hours at temperatures above 40 deg F (5 deg C) before testing.

J. Install piping in sleeves under parking lots, roadways, and sidewalks.

K. Install sleeves made of Class 200 PVC pipe and socket fittings, and solvent-cemented joints.

L. Install transition fittings for plastic-to-metal pipe connections according to the following:

1. Underground Piping:

   a. NPS 1-1/2 (DN 40) and Smaller: Plastic-to-metal transition fittings.
   b. NPS 2 (DN 50) and Larger: AWWA transition couplings.

2. Aboveground Piping:

   a. NPS 2 (DN 50) and Smaller: Plastic-to-metal transition fittings.
   b. NPS 2 (DN 50) and Larger: Use dielectric flange kits with one plastic flange.

3.4 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Copper-Tubing Brazed Joints: Construct joints according to CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.

E. Copper-Tubing Soldered Joints: Apply ASTM B 813 water-flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B 32.

F. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

   1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
   2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.5 VALVE INSTALLATION

A. Install in underground piping in boxes for automatic control valves. Install DBY splice kits at each automatic control valve. Fittings and nipples as required.

3.6 DRIP INSTALLATION

A. Install drip after hydrostatic test is completed.

B. Install drip by manufacturer's recommended installation procedures.

3.7 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install interior controllers on wall.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Equipment Mounting: Install exterior freestanding controllers on precast concrete bases.

1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Install control cable in same trench as irrigation. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas. Use expansions loops, by wrapping around a 1" dowel 12" long, every 500'.

3.8 CONNECTIONS

A. Comply with requirements for piping specified in Section 221000 "Plumbing Piping and Valves" for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controllers and automatic control valves.

3.9 IDENTIFICATION

A. Identify system components. Provide equipment nameplates and signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.

1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

B. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches.

3.10 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Any irrigation product will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Startup service shall be the responsibility of the irrigation installer.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.12 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

3.13 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.14 DEMONSTRATION

A. Instruct the Owner's maintenance personnel to adjust, operate, and maintain this system.

3.15 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Underground irrigation main piping:
   1. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent-cemented joints.

D. Underground Circuit piping,
   1. Poly pipe and insert and saddle fittings.

END OF SECTION 32 84 00

SECTION 32 91 13
CU STRUCTURAL SOIL

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 work includes but is not limited to the following:
   1. Supply and installation of Structural Soil.

   2. Supply and installation of all related items as indicated on the Drawings or as specified herein.

B. CU Soil is patented by Cornell University (US Patent # 5,849,069). Only licensed producers are allowed to supply this material, meeting the specifications described in this text, see Part 2 for licensed producers.

1.3 RELATED WORK

A. Excavation – Earth and Rock: Section 31 23 16

B. Planting Soil Mix: Section 32 93 20

C. Planting: Section 32 93 30

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Samples: Submit samples of the following items:

   1. Clay Loam: One (1) pound bags.
      a. In the event of multiple source fields for Clay Loam, submit a minimum of one set of samples per source field or stockpile

      b. Samples shall be labeled to include the location of the source of the material, the date of the sample and the Contractor's name.

   2. Crushed Stone: One (1) pound bags.

3. Structural Soil: One (1) pound bags.

C. Test Results:
Submit written reports, as specified herein, for each sample of Clay Loam and Structural Soil from an approved soil-testing laboratory. The soil testing laboratory shall be approved by the Commissioner. The testing laboratory for particle size and chemical analysis may be a public agricultural extension service agency or agricultural experiment station.

The test results shall report the following:

1. Bulk density of the sample and particle size analysis including the following gradient of mineral content:

USDA Designation	Size in mm.
Gravel	greater than 2 mm
Sand	0.05 – 2 mm
Silt	0.002-0.05 mm
Clay	less than 0.002 mm

Sieve analysis shall be performed and compared to USDA Soil Classification System. Sieve analysis shall be done by a combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D422 after destruction of organic matter by hydrogen peroxide.

2. Submit a chemical analysis, performed in accordance with current AOAC Standards, including the following:
   a. pH and Buffer pH.

   b. Percent organic matter as determined by the loss of ignition of oven dried samples. Test samples shall be oven dried to a constant weight at a temperature of 230 degrees F, plus or minus 9 degrees.

   c. Analysis for nutrient levels by parts per million including nitrate nitrogen, ammonium nitrogen, phosphorus, potassium, magnesium, manganese, iron, zinc, calcium and extractable aluminum. Nutrient test shall include the testing laboratory recommendations for supplemental additions to the soil as calculated by the amount of material to be added per volume of soil for the type of plants to be grown in the soil.

   d. Analysis for levels of toxic elements and compounds including arsenic, boron, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, zinc and PCB. Test results shall be cited in milligrams per kilogram.

   e. Soluble salt by electrical conductivity of a 1:2 soil/water sample measured in millimhos per cm.

f. Cation Exchange Capacity (CEC).

g. Carbon/Nitrogen Ratio.

3. Submit 5-point minimum moisture density curve AASHTO T 99 test results for each Structural Soil sample without removing oversized aggregate.

4. Submit measured dry-weight percentage of stone in the mixture.

D. Crushed Stone Analysis:

1. Provide a particle size analysis including the following gradient of mineral content:

USDA Designation	Size in mm.
3"	greater than 76 mm
2-1/2"	63-76 mm
2"	50-63 mm
1-1/2"	37-50 mm
1"	25-37 mm
¾"	19-25 mm
Fine gravel	2-19 mm
Sand	0.05-2 mm
Silt	0.002-0.05 mm
Clay	less than 0.002 mm

2. Provide analysis of the following:

a. Loose and rodded unit weight.

b. Bulk specific gravity and absorbency.

c. Stone dimension and surface texture description.

d. Provide a percent pore space analysis defined as follows: Rodded Unit Weight divided by the Bulk Specific Gravity x 100

E. Manufacturer's Data:

1. Fertilizer, each type to be used
2. Hydrogel

1.5 INSTALLER QUALIFICATIONS

A. The contractor or subcontractor performing the work of this section must within the last five (5) consecutive years prior to the bid opening, have successfully completed in a timely fashion at least three (3) projects similar in scope and type to the required work.

1.6 REFERENCES AND STANDARDS

A. ASTM: American Society of Testing Materials

B. USDA: United States Department of Agriculture

C. AASHTO: American Association of State Highway and Transportation Officials

D. AOAC: Association of Official Agricultural Chemists

1.7 DELIVERY, STORAGE AND HANDLING

A. Do not deliver or place soils in frozen, wet, or muddy conditions. Material shall be delivered at or near optimum compaction moisture content as determined by AASHTO T99 (ASTM D 698). Do not deliver or place materials in an excessively moist condition (Beyond two percent above optimum compaction moisture content as determined by AASHTO T 99 (ASTM D 698).

B. Protect soils and mixes from absorbing excess water and from erosion at all times. Do not store materials unprotected from large rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after grading, allow material to drain or aerate to optimum compaction moisture content.

1.8 EXAMINATION OF CONDITIONS

A. All areas to receive Structural Soil shall be inspected by the Contractor before starting work and all defects such as incorrect grading, compaction and inadequate drainage etc. shall be reported to the Commissioner prior to beginning this work.

B. The Contractor shall be responsible for judging the full extent of work requirements involved, including but not limited to the potential need for temporary storage and staging of soils, including moving soil stock piles at the site to accommodate scheduling of other work and the need to protect installed soils from compaction, erosion and contamination.

PART II - PRODUCTS

2.1 STRUCTURAL SOIL

A. CU Soil is patented by Cornell University (US Patent # 5,849,069). Only licensed producers are allowed to supply this material, meeting the specifications described in this text.

1. Licensed producers include:

a. East Coast Mines & Materials, Inc. East Quogue, NY
Contact: John Tintle 631-653-5445

b. Advanced Soil Technologies, East Brunswick, NJ
Contact: Patrick Schlagenhaft 732-840-1700

c. Ascape Landscape, Blauvelt, NY
Contact: Stu Chaitin 845-353-6500

d. or approved equal.

2. For a full list of licensed CU-Soil producers, contact AMEREQ, INC. 800-832-8788.

B. Structural Soil shall consist of a uniformly blended mixture of Crushed Stone, Clay Loam and Hydrogel, mixed to the following proportions:

Material	Unit of Weight
Crushed Stone	100 units dry weight
Loam	as determined by the test of the mix (approx. 20 units)
Hydrogel	0.03 units dry weight
Total moisture	AASHTO T-99 optimum moisture

C. The initial mix design for testing shall be determined by adjusting the ratio between the Crushed Stone and the clay loam. Adjust final mix dry weight mixing proportion to decrease soil in mixture if CBR test results fail to meet acceptance (CBR #50).

D. Soil amendment materials shall be added to the mix as specified herein.

2.2 CRUSHED STONE

A. Crushed Stone shall be a DOT certified crushed stone. Granite and limestone have been successfully used in this application. Stone shall conform to the following:

1. A ratio of nominal maximum to nominal minimum particle size of 2 is required.

2. Acceptable aggregate dimensions will not exceed 2.5:1.0 for any two dimensions chosen.

3. Minimum 90% with one fractured face, minimum 75% with two or more fractured faces.

4. Results of Aggregate Soundness Loss test shall not exceed 18%.

5. Losses from LA Abrasion tests shall not exceed 40%.

6. Stone Gradation:

Sieve Size	Percent Passing
1.5 inch	90-100%
1 inch	20-55%
3/4 inch	10%

2.3 CLAY LOAM

A. Clay Loam shall be a "loam" based on the "USDA classification system" as determined by mechanical analysis (ASTM D-422) and it shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one-half inch, lumps, plants

and their roots, debris and other extraneous matter over one inch in diameter or excess of smaller pieces of the same materials as determined by the Commissioner.

B. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well-drained areas, which have never been stripped of topsoil before and have a history of satisfactory vegetative growth.

C. Organic Matter:
As determined by the loss on ignition of over-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F., plus or minus 9 degrees.
2% minimum - 5% maximum

D. Mechanical analysis for a Loam/Clay Loam shall be as follows:

Textural Class	Percent of Total Weight
Gravel	less than 5%
Sand	20-45%
Silt	20-50%
Clay	20-40%

E. Chemical analysis:
Loam shall meet or be amended to meet the following criteria:

1. pH between 5.5 to 6.5.
2. Percent organic matter 2-5% by dry weight.
3. Nutrient levels as required by the testing laboratory recommendations for the type of plants to be grown in the soil.
4. Toxic elements and compounds below the United States Environmental Protection Agency Standards for Exceptional Quality sludge or local standard; whichever is more stringent.
5. Soluble salt less than 1.0 Millimho per cm.
6. Cation Exchange Capacity (CEC) greater than 10.
7. Carbon/Nitrogen Ratio less than 33:1.

F. Loam/Clay Loam shall be the product of a commercial processing facility specializing in production of stripped natural topsoil. No topsoil shall come from USDA - classified prime farmland.

2.4 HYDROGEL

A. Hydrogel shall be a potassium propenoate-propenamide copolymer specifically formulated for use in structural soil mixes.

2.5 FERTILIZER

A. Commercial fertilizer complying with State and United States fertilizer laws. Deliver fertilizer in original unopened containers, which shall bear the manufacturer's certificate of compliance covering analysis, which shall be furnished to the Commissioner.

B. Fertilizer shall be formulated for mixing into the soil and be certified by the manufacturer to provide controlled release of nitrogen continuously for a period of no less than nine months and no more than 12 months.

C. Fertilizer percentages of weight of ingredients and application rates shall be as recommended by the soil testing results.

2. 6 LIME

A. If needed to raise pH, shall be agricultural limestone containing a minimum of 85% carbonates.

B. Minimum gradation:

Sieve Size	Percent Passing
10 mesh	100%
20 mesh	98%
60 mesh	55%
100 mesh	40%

2.7 SULFUR

A. If needed to lower pH, sulfur shall be commercial granular, 96% pure sulfur, delivered in containers with the name of the manufacturer, material and analysis appearing on the container. Sulfur used to lower soil pH above 6.5 shall be ferrous sulfate formulation.

2.8 WATER

A. The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. All work inured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

PART III - EXECUTION

3.1 MIX DESIGN

A. Prepare sample Structural Soil mixes to determine the ratio of mix components. Submit for approval.

B. Submit samples and the test results of each mix component for approval. Based on samples and the analysis of the mix components, the Commissioner and the Contractor

will jointly determine a mix ratio to be tested for conformance with the requirements of the specifications.

C. For Structural Soil quantities greater than 500 cubic yards, test the mix ratio for each Clay Loam or Crushed Stone where the testing indicates a significant difference in physical analysis of the Clay Loam or Crushed Stone as determined by the Commissioner.

D. Prepare samples of the proposed mix ratio options and obtain soil test as described in the Submittals section of this Specification. Submit the samples of each of the mixes with the test results.

E. The Commissioner may request additional Structural Soil mix ratio samples to be tested in the event that further refinement of the mix is necessary.

F. Submit to the Commissioner proposed fertility amendment recommendations including amounts and types of fertilizers and pH adjustments for each mix ratio. Fertility adjustments shall be included as part of the mixing process.

3.2 SOIL MIXING AND QUALITY CONTROL TESTING

A. All Structural Soil mixing shall be performed at the Producer's yard using appropriate soil measuring, mixing and shredding equipment of sufficient capacity and capability to assure proper quality control and consistent mix ratios. No mixing of Structural Soil at the project site shall be permitted. Portable pugging may be used.

1. Maintain adequate moisture content during the mixing process. Soils and mix components shall easily shred and break down without clumping.

2. Soil clods shall easily break down into a fine crumbly texture. Soils shall not be overly wet or dry.

3. The contractor shall measure and monitor the amount of soil moisture at the mixing site periodically during the mixing process.

B. A mixing procedure for front-end loader shall be as follows:

1. On a flat asphalt or concrete paved surface, spread an 8 inch to 12 inch layer of crushed stone.

2. Spread evenly over the stone the specified amount of dry hydrogel.

3. Spread over the dry hydrogel and crushed stone a proportional amount of clay loam according to the mix design.

4. Blend the entire amount by turning, using a front-end loader or other suitable equipment until a consistent blend is produced.

5. Add moisture gradually and evenly during the blending and turning operation as required to achieve the required moisture content. Delay applications of moisture

for 10 minutes prior to successive applications. Once established, mixing should produce a material within 1% of the optimum moisture level for compaction.

6. Add soil amendments to alter soil fertility including fertilizers and pH adjustment at the time of mixing at the rates recommended by the soil test.

7. Soil pH shall be adjusted to fall within a value of 5.5 and 6.5 two months after mixing if the material is stored, unless mixing with a high pH stone.

8. Soil component carbon/nitrogen ratio shall be adjusted to be less than 33:1 within two months after mixing.

C. The Producer shall mix sufficient material in advance of the time needed at the job site to allow adequate time for final quality control testing as required by the progress of the work. Structural Soil shall be stored in piles of approximately 500 cubic yards and each pile shall be numbered for identification and quality control purposes. Storage piles shall be protected from rain and erosion by covering with plastic sheeting.

D. During the mixing process, the Contractor obtains two, one cubic foot quality control samples per 500 cubic yards of production from the final Structural Soil. The samples shall be taken from random locations in the numbered stockpiles as required by paragraph 1.3.B of this specification. Each sample shall be tested for particle size analysis and chemical analysis as described in Paragraph 1.3.C.2 and 3 above. Submit the results directly to the Commissioner for review and approval.

E. The quality control sample Clay Loam-Crushed Stone ratios shall be no greater or less than 2% of the approved test sample as determined by splitting a known weight of oven dried material on a #4 sieve. In the event that the quality control samples vary significantly from the approved Structural Soil sample, as determined by the Commissioner, remix and retest any lot of soil that fails to meet the correct analysis making adjustments to the mixing ratios and procedures to achieve the approved consistency.

3.3 UNDERGROUND UTILITIES AND SUBSURFACE CONDITIONS

A. Notify the Commissioner of any subsurface conditions which will affect the Contractor's ability to complete the work.

B. Locate and confirm the location of all underground utility lines and structures prior to the start of any excavation.

C. Repair any underground utilities or foundations damaged by the Contractor during the progress of this work. The cost of all repairs shall be at the Contractor's expense.

3.4 SITE PREPARATION

A. Do not proceed with the installation of the Structural Soil material until all walls, curb footings and utility work in the area have been installed. For site elements dependent on

Structural Soil for foundation support, postpone installation until immediately after the installation of Structural Soil. Install subsurface drain lines as shown on the Drawings prior to installation of Structural Soil material.

B. Excavate and compact the proposed subgrade to depths, slopes and widths as shown on the Drawings. Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not over excavate compacted subgrades of adjacent pavement or structures.

C. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope parallel to the finished grade and or toward the subsurface drain lines as shown on the drawings.

D. Clear the excavation of all construction debris, trash, rubble and any foreign material. In the event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into the subgrade material, excavate the soil sufficiently to remove the harmful material. Fill any over excavation with approved fill and compact to the required subgrade compaction.

E. Do not proceed with the installation of Structural Soil until all utility work in the area has been installed. All subsurface drainage systems shall be operational prior to installation of Structural Soils.

F. Maintain all silt and sediment control devices required by applicable regulations. Provide adequate methods to assure that trucks and other equipment do no track soil from the site onto adjacent property and the public right of way.

G. Protect adjacent walls, walks and utilities from damage or staining by the soil. Use ½" plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work.

3.5 INSTALLATION OF STRUCTURAL SOIL MATERIAL

A. Install Structural Soil in 6 inch lifts and compact each lift.

B. Compact all materials to peak dry density from a standard AASHTO compaction curve (AASHTO T 99). No compaction shall occur when moisture content exceeds maximum as listed herein. Delay compaction 24 hours if moisture content exceeds maximum allowable and protect Structural Soil during delays in compaction with plastic or plywood as directed by the Commissioner.

C. Bring Structural Soils to finished grades as shown on the Drawings. Immediately protect the Structural Soil material from contamination by toxic materials, trash, debris, water containing cement, clay, silt or materials that will alter the particle size distribution of the mix with plastic or plywood as directed by the Commissioner.

D. The Commissioner may periodically check the material being delivered and installed at the site for color and texture consistency with the approved sample provided by the

Contractor as part of the submittal for Structural Soil. In the event that the installed material varies significantly from the approved sample, the Commissioner may request that the Contactor test the installed Structural Soil. Any soil which varies significantly from the approved testing results, as determined by the Commissioner, shall be removed and new Structural Soil installed that meets these specifications.

3.6 FINE GRADING

A. After the initial placement and rough grading of the Structural Soil but prior to the start of fine grading, the Contractor shall request review of the rough grading by the Commissioner. The Contractor shall set sufficient grade stakes for checking the finished grades.

B. Adjust the finish grades to meet field conditions as directed.
   1. Provide smooth transitions between slopes of different gradients and direction.
   2. Fill all dips with CU-Soil and remove any bumps in the overall plane of the slope.
   3. The tolerance for dips and bumps in Structural Soil areas shall be a 3 inch deviation from the plane in 10 feet.

C. All fine grading shall be inspected and approved by the Commissioner prior to the installation of other items to be placed on the Structural Soil

D. The Commissioner will inspect the work upon the request of the Contractor. Request for inspection shall be received by the Commissioner at least 10 days before the anticipated date of inspection.

3.7 CLEAN UP

A. At the end of each workday the Contractor shall clean the site, to remove all trash, debris, and loose soil materials. Store materials and equipment where directed.

B. Sweep, do not wash, all paving and other exposed surfaces of dirt and mud until the paving has been installed over the Structural Soil material. Do no washing until finished materials covering Structural Soil material are in place.

C. Immediately following the completion of Structural Soil installation operations, the Contractor shall remove all excess materials, stockpiles, waste material, tools and equipment, and leave the site in a clear and clean condition.

D. Immediately remove all rejected materials from the site. All rejected materials and other waste or debris shall become the property of the Contractor, who shall legally dispose of same off-site.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 32 93 20
PLANTING SOIL MIX

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.

1.2 SUMMARY

A. This work includes but not is not limited to the following:
   1. Supply of component materials and soil amendments for Planting Soil Mix.
   2. Preparation and blending of Soil Mix.
   3. Installation, placement, spreading, and fine grading of Soil Mix.
   4. Testing of all soil component materials, soil amendment materials, and Soil Mix.

1.3 RELATED SPECIFICATIONS

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Planting: Section 32 93 30

D. CU Structural Soil: Section 32 91 13

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the General Conditions.

B. Product Data: Submit manufacturer's technical information, including application instructions for the following items:
   1. Fertilizers
   2. Herbicides
   3. Water-absorbent polymer
   4. Perlite

C. Samples: 1 lb. packaged samples for:
   1. Topsoil

2. Compost

3. Blended Soil Mix

D. Test Results for Soil Mix Components:
Submit written reports, as specified herein, for each bulk component:
1. Topsoil

2. Sand

3. Compost

4. Crushed Stone

E. Test Results for Blended Soil Mix:
Submit written reports, as specified herein, for blended soil mix.

1.5 TESTING

A. Contractor shall submit written test reports for all material samples.
1. Testing shall be carried out by an independent testing laboratory.

2. Testing laboratory shall be approved by Commissioner.

3. All testing required by this Section, or additionally required by Commissioner, shall be furnished and paid for by Contractor.

4. Contractor shall be responsible for timely submittal of samples to the testing laboratory.

B. Each test shall be carried out using the categories and sieve sizes as specified herein. Failure to include any of the required criteria will be sufficient cause for rejection of the test.

C. Each test report shall include the following information:
1. Project Title
2. Name of Contractor
3. Name of material supplier
4. Testing Laboratory name, address and telephone number
5. Type of test
6. Date of test
7. Test results, including identification of deviations from acceptable ranges.

D. Each sample shall be tested for the following:
1. Mechanical analysis: Sieve method, using sieve sizes specified.

2. pH

3. Organic matter content: Percentage of oven-dry weight of soil, determined by loss on ignition of moisture-free sample, in accordance with Method A of ASTM F1647-02a.

4. Electrical conductivity(Soluble Salts): Test by saturated paste method, in deciSiemens per meter (dS/m).

5. Analysis of minerals: Nitrogen, phosphorus, and potassium, in parts per million.

6. Analysis of heavy metals: In parts per million, performed by a testing laboratory certified by NYSDOH-ELAP (New York State Department of Health Environmental Laboratory Accreditation Program) in accordance with EPA standard methods 3050B, 3051A and 6020A

7. Corrective recommendations for nutrients and pH.

E. The Commissioner may take and analyze at any time, such additional samples of materials as deemed necessary for verification of conformance to specification requirements. Contractor shall furnish samples for this purpose upon request and shall perform testing as requested at no additional cost to the City of New York.

F. No component bulk material for Soil Mix shall be used or blended into a mix, until test reports have been received and approved by the Commissioner. As necessary, make any and all soil mix amendments and resubmit test reports indicating amendments, until approved.

1.6 REFERENCES

A. ASTM D698: Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))

B. ASTM F1647 - 02a: Standard Test Methods for Organic Matter Content of Putting Greens and Sports Turf Root Zone Mixes.

1.7 REGULATORY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary for work to comply with such requirements at no additional cost to City.

B. Procure and pay for all permits and licenses required for the Work of this Section.

1.8 DELIVERY AND STORAGE

A. Conform to all governmental regulations in regard to the transportation of materials to, from, and at the job site, and secure in advance such permits as may be necessary.

B. Packaged Materials: Deliver packaged materials to the location where planting Soil Mixes are to be blended, in unopened bags or containers, each bearing the name and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the material.
1. All bags shall be protected from water and contamination with other materials.

2. Retain packages for inspection by Commissioner.

3. All packaged materials shall be stored, handled and applied in strict accordance with manufacturer's instructions.

C. Stockpiles;
Stockpiles of on-site or off-site bulk materials and Soil Mixes shall not exceed 50 cubic yards, and shall be no more than 6 feet in height to prevent anaerobic conditions within the piles.
1. All stock piled materials shall be adequately covered with tarpaulins or otherwise protected to prevent excessive water absorption and blowing by winds, until time of actual use.

PART II - PRODUCTS

2.1 GENERAL

A. All Soil Mix components shall be tested and approved prior to incorporation into blended Soil Mix.

B. Provide adequate quantities of all Soil Mix materials to meet design finished grades after compaction and natural settlement.

2.2 PLANTING SOIL MIX

A. Planting Soil Mix shall consist of the following proportions by volume:
Three parts topsoil as specified herein
Two parts sand as specified herein
One part compost as specified herein

B. The following items shall be added to the above mix:
Five pounds bonemeal per cubic yard of soil mixture
One pound commercial fertilizer per cubic yard of soil mixture
One pound controlled release fertilizer per cubic yard of soil mixture
Two pounds water absorbent polymer per cubic yard of soil mixture, or as recommended by manufacturer
Ground limestone or elemental sulphur as required to achieve for specified pH

C. Planting Soil Mix shall conform to the following requirements:

Organic Matter:	4 % minimum – 12% maximum
pH:	6.0 - 7.2
Nitrogen:	More than 12 ppm
Phosphorus:	More than 7 ppm
Potassium:	More than 150 ppm
Soluble salts:	Electrical conductivity 0.7 dS/m minimum 2.0 dS/m maximum

2.3 HEAVY METALS

A. Total heavy metal concentrations in blended soil mix shall not exceed the following limits:

	Allowed Concentration in parts per million
Arsenic	13
Boron	300
Cadmium	2.5
Chromium	30
Copper	100
Lead	63
Mercury	0.50
Molybdenum	10
Nickel	30
Selenium	25
Zinc	400

2.4 TOPSOIL

A. All topsoil shall consist of natural loam, free from subsoil.
   1. Topsoil shall be removed to a depth of 12 inches, or less if subsoil is encountered.

   2. Topsoil shall be of uniform quality, free from hard clods, stiff clay, hardpan, sods, roots, chips, sticks, partially disintegrated stone, cement, ashes, paper, boards, or any other undesirable material.

   3. Topsoil shall be free of all materials harmful or toxic to plant growth.

B. Topsoil shall conform to the following requirements:

pH:	5.5 to 7.0
Organic content:	5% minimum

C. Topsoil shall conform to the following mechanical analysis:

Sieve Size	Percent Passing
1"	100
1/4"	90 - 100
#10	60 - 80
#40	40 - 60
#60	40 - 60
#100	10 - 30
#200	10 - 20

2.5 COMPOST

A. Shall conform to the following requirements:
   1. Material shall be capable of sustaining the growth of vegetation, with no admixture of refuse or material toxic to plant growth.

2. Material shall be derived from organic wastes such as food and agriculture residues, composted cow or other animal manures, sewage sludge or other materials that meet the specified requirements.

3. Compost shall be screened, and shall be free of any stones, branches, roots or wood chips, and all debris such as plastic fragments, glass, and metal fragments.

4. Material shall be composted for a minimum of one year (12 months).

B. Compost shall conply with the following requirements:

Organic content:	35% minimum
pH:	6.0 to 7.5
Carbon/nitrogen ratio:	25:1 to 35:1
Passing 1/2" screen:	100%

C. Heavy metal content of compost shall not to exceed the following indicated amounts:

Allowed Concentration in parts per million	
Arsenic	13
Boron	300
Cadmium	2.5
Chromium	30
Copper	100
Lead	63
Mercury	0.50
Molybdenum	10
Nickel	30
Selenium	25
Zinc	400

2.6 SAND

A. Sand shall be clean washed sand conforming to the following requirements of ASTM C33 Fine Aggregate.

2.7 SOIL AMENDMENT MATERIALS

A. Bonemeal:
Shall be finely ground and have the following N-P-K (Nitrogen-Phosphorus-Potassium) analysis: 4-12-0.

B. Commercial Fertilizer:
Shall have the following N-P-K analysis: 10-6-4.
1. A minimum of 50% of the nitrogen shall be derived from organic sources.
2. If soil tests indicate need for a different composition, Contractor shall submit proposed alternate fertilizer for approval.

C. Controlled-release Fertilizer:
Shall be in granular form and shall have the following N-P-K analysis: 10-6-4.

1. Fertilizer shall be as manufactured by Osmocote, Meister, or other approved manufacturer.
2. If soil tests indicate need for a different composition, Contractor shall submit proposed alternate fertilizer for approval.

D. Limestone:
Shall be granular limestone, produced from Dolomitic limestone specifically for use in planting, with a minimum of 88% of calcium and magnesium carbonates.

E. Sulphur:
1. Lower pH if required, by use of elemental sulfur product.
2. Peat moss or copper sulfate may not be used to lower pH.

F. Herbicides:
Acceptable products:
1. Post-emergent herbicide, for lawn areas and plant beds: Shall be Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166, or approved equal.

2. Pre-emergent herbicide, not to be used at lawn areas or grasses: Shall be Treflan 5G, or approved equal.

G. Water-absorbent Polymer:
Acceptable products:
1. Supersorb, manufactured by Aquatrols of America, Pennsauken, NJ 08110. Tel: (800) 257-7797.

2. Terrasorb, manufactured by Industrial Services International, Bradentown, FL 34282. Tel: (800) 277-6728.

3. Agrosoke, manufactured by Grosoke International Inc., Fort Worth, TX 76118. Tel: (800) 522-0696.

4. Or approved equal.

2.8 DRAINAGE GRAVEL

A. Drainage gravel shall comply with the requirements of Drainage Fill as specified in Section 312323: Backfilling.

PART III - EXECUTION

3.1 INSPECTION AND COORDINATION

A. Contractor shall inspect the site before construction and soil mix placement operations, and verify the location of all existing and proposed electric cables, conduits, irrigation, under-drainage systems and all other underground or at grade utilities, by contacting the appropriate utility company.
1. Contractor shall take proper precautions so as not to disturb or damage any sub-surface elements.

2. Contractor shall be liable for and all damage to such utilities during the course of construction, and shall be responsible for making requisite repairs to damaged utilities at no additional expense.

3. Contractor shall be liable for any and all damage to surrounding areas caused by planting operations and shall be required to restore or replace damage areas to original conditions, to the satisfaction of the Commissioner.

B. Coordination: Coordinate the work of this Section with other work of the Project and with work of other Contractors. Such coordination shall include but not be limited to:
Location of all underground utility lines and structures.
Scheduling of planting operations.
Scheduling of maintenance operations.

C. Verify that all work requiring access through or adjacent to areas where soil mixes are to be placed has been completed and no further access (other than Landscape installation) will be required. In the event that access will be required, this must be coordinated with the Commissioner.

3.2 WEATHER LIMITATIONS

A. Perform both blending and site soil work only during suitable weather conditions. Do not handle, haul, place, work, disc or rototill soil when frozen, excessively wet, or in otherwise unsatisfactory condition.

3.3 PREPARATION OF SOIL MIXES

A. Uniformly blend all ingredients as required for Soil Mix by wind rowing and/or tilling on a hard surfaced area.
1. The components of all soil mixes shall be blended so that ingredients are thoroughly incorporated into the mixture to assure uniform distribution.

2. Do not over-mix. Mix shall remain friable and well aerated.

3. Organic matter shall be maintained moist, not wet, during blending.

4. Delay mixing of fertilizers if planting will not follow within a few days.

3.4 PREPARATION OF SUB-GRADE

A. Verify as-constructed or existing sub-grade elevation and perform additional grading operations as necessary to bring the sub-grade to a true, smooth, slope parallel to the finished grade, at all areas to receive soil mixes.

B. Any sub-grades or soils polluted by gasoline, oil, plaster, construction debris, unacceptable soils, or other substances which would render material unsuitable for plant growth, shall be removed from the premises whether or not such pollution occurred or existed prior to or during the Contract period. In the event that such material is placed, this material shall be removed and replaced with approved material. All remedial

operations associated with soil mixes shall be reviewed and approved by the Commissioner.

C. Clean sub-grade and dispose of all debris prior to placement of soil mixes.
   1. Remove all large clods, lumps, brush, roots, stumps, litter, trash, and other foreign material and stones one-half inch in diameter or larger.

   2. Dispose of removed material legally off-site.

D. Spray all vegetation on sub-grade with a pre-emergent weed killer at the rate of application recommended by the manufacturer.

E. Protect adjacent pavements, walls, utilities and other construction from damage or staining by any soil mix placement operations.

3.5 PLACEMENT OF PLANTING SOIL MIX

A. Do not place any muddy or wet Soil Mix.

B. Place and spread Soil Mix over sub-grade, to a depth sufficiently greater than the depth required for planting areas so that after settlement the completed work will conform to the lines, grades, and elevations shown or otherwise indicated.

C. Place and spread Soil Mix over the approved sub-grade, in 6-inch lifts, or as directed by Commissioner, and settle to eliminate air pockets and minimize settlement. Lightly scarify previously placed surfaces prior to placing subsequent lifts.

D. Compact to not less than 90% Modified Proctor.
   1. Provide compaction testing to conform compliance to specified compaction density.

   2. Fills shall not be so compacted as to restrict the flow of air or water through the soil.

   3. After completion of compaction operations, protect the installation from contamination by toxic materials or trash, and from water containing cement, clay, silt or any other materials.

3.6 GRADING OF SOIL MIX

A. After settlement has occurred, add soil to maintain finished grades. If for any reason soil is left exposed for a long duration prior to planting, add soil and regrade as required.

B. Protect placed Soil Mixes against construction activity with snow fencing or by other acceptable methods. Protect from the eroding effects of wind and rain with jute mesh or filter fabric, as necessary.

3.7 CLEAN UP

A. At the end of each work day the Contractor shall broom-clean the site, to remove all trash, debris, and loose soil materials.

B. Immediately following the completion of soil mix installation operations, the Contractor shall remove all excess materials, stock piles, waste material, tools and equipment, and leave the site in a clear and clean condition.

C. All waste materials shall become the property of the Contractor, who shall legally dispose of same off-site.

END OF SECTION

SECTION 32 93 30
PLANTING

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 work includes but is not limited to the following:
   1. Supply and installation of new trees, shrubs, vines, and all other plant materials.
   2. Supply and installation of mulch.
   3. Supply and installation of fertilizers and bio-stimulants.
   4. Guarantee of all new plant materials for a period of two (2) years.
   5. Protection and maintenance of all plant materials through Substantial Completion and during the Guarantee Period.
   6. Provision of maintenance schedule and manual as described herein.

1.3 RELATED WORK

A. Excavation – Earth and Rock: Section 31 23 16

B. Backfilling: Section 31 23 23

C. Planting Soil Mix: Section 32 93 20

D. CU Structural Soil: Section 32 91 13

1.4 SUBMITTALS

A. All submittals shall conform to the requirements specified in the DDC General Conditions.

B. Product Data:
Submit manufacturer's product information for the following items, showing conformance with the specified requirements:
   1. Geotextile
   2. Tree anchoring system.

3. Fertilizers
4. Bio-stimulants

C. Submit samples of Mulch - One (1) pound bag.

D. Submit list of proposed sources for plant materials, including nursery name, location, contact information, and materials to be sourced for each.

E. Documentation:
Submit written documentation at least 30 days prior to scheduled start of planting that all plant material has been ordered.

F. Maintenance Program:
1. Submit written schedule of maintenance operations proposed for the guarantee period. Schedule shall be in the form of a list of each maintenance operation, with dates showing when each maintenance task will be performed, and the frequency of occurrence.

G. Maintenance Manual:
Submit written schedule and detailed description of maintenance tasks for ongoing maintenance of all planting including each planted area and each plant material, for use by Commissioner's maintenance staff after Contractor maintenance has terminated.

1.5 REFERENCES

A.	AAN:	American Association of Nurserymen.
B.	AASHTO:	American Association of State Highway and Transportation Officials.
C.	ASNS:	"American Standard for Nursery Stock," ANSI Z60.1 latest edition, published by the American Association of Nurserymen, (AAN).
D.	ASTM:	American Society for Testing and Materials.
E.	ISA:	International Society of Arboriculture, Tree and Shrubs Transplanting Manual, Latest Edition.
F.	NAA:	National Arborist Association, Standards.
G.	SPN:	"Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.

1.6 PLANT SELECTION AND INSPECTION

A. Inspection at Nursery
All plants will be inspected and selected by the Commissioner at the nursery for conformity to specification requirements. If approved, such approval shall not affect the right of inspection and rejection during delivery and installation. At the discretion of the Commissioner,

representative samples may be approved at the nursery in lieu of selecting each plant. Plants to be supplied shall match the sample for all characteristics.

B. Inspection at Delivery - On Site
Notify the Commissioner at least five (5) working days in advance of delivery of plants to the site. The Commissioner will inspect all plants upon delivery to site. Contractor shall schedule a time for on-site inspection prior to planting, and shall arrange for adequate labor and equipment on-site at the time of inspection to unload, open, and handle plants during inspection.
1. The Commissioner may reject any plant material prior to or upon delivery to the site.
2. All plant material which is dead, dying or appears unhealthy will be rejected.
3. All plant material which has been improperly maintained, dug, transported or handled in such a way as to impair its appearance or health will be rejected.
4. The Commissioner will be the sole judge of the condition of the plants.

C. All material which is rejected on-site shall be removed immediately from site, and replaced with new material selected by the Commissioner, at no additional cost to the City of New York.

1.7 REGULATORY REQUIREMENTS

A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment and services necessary for work to comply with such requirements at no additional cost to City of New York.

B. Procure and pay for permits and licenses required for work of this Section. Obtain all required permits in a timely manner to avoid delays to the work.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials:
Deliver packaged materials in unopened bags or containers, each clearly bearing the name of the producer, the material composition, manufacturers' certified analysis, and the weight of the material.
1. All packaged products shall be stored, handled and applied in strict accordance with manufacturer's instructions.

B. Dig and handle all plant material to prevent injury to trunks, branches and roots.
All plants specified as B & B (balled and burlapped) in the Plant List shall be dug with sufficient roots and shall have a solid ball of earth securely held in place by burlap and rope.
1. Do not prune prior to delivery.
2. Do not bend or bind-tie trees in such manner as to damage bark, break branches or destroy natural shape.

C. Pack and ship all plant material to ensure arrival at site in good condition. Provide protective covering during delivery.

D. If planting is delayed more than 24 hours after delivery, Contractor shall provide adequate means of protection from freezing and from the drying effects of wind and sun.
   1. Rootballs shall be protected with soil, wet mulch, or other acceptable material.
   2. Provide shade structures or other covering as required to protect branches and leaves.
   3. Water as necessary until planted.

E. Immediately remove rejected or damaged plant material from the site and replace with plants approved by Commissioner. All replacement plants shall be subject to the same requirements as the original material.

1.9 COORDINATION

A. The Landscape subcontractor shall coordinate his work with that of other subcontractors. Such coordination shall include but not be limited to:
   1. Location of all underground utility lines and structures.
   2. Scheduling of planting operations.
   3. Scheduling of maintenance operations.

1.10 SUBSTANTIAL COMPLETION

A. Contractor shall submit a written request to the Commissioner, for a formal inspection of the planting work for Substantial Completion.
   1. At the time of inspection all plant material must be alive, healthy, and installed as specified to be accepted.
   2. If plants are dead, dying or unhealthy, in the opinion of the Commissioner, or if workmanship is unacceptable, written notice will be given to the Contractor in the form of a punch list which itemizes all remedial work required for Substantial Completion.
   3. This work may include plant replacement or maintenance, and must be carried out prior to issuance of the Certificate of Substantial Completion.

1.11 GUARANTEES

A. All plants shall be guaranteed as specified in the Addendum to the General Conditions, beginning at the date of issuance of the Certificate of Substantial Completion.

B. During the Guarantee Period the Contractor shall be responsible for all plant maintenance:
   1. Contractor shall submit a written maintenance program and schedule to the Commissioner for approval.

2. Maintenance program shall be revised and resubmitted as required until approved by Commissioner.

3. During the Guarantee Period, the Contractor will maintain all plant materials as specified herein, and as noted in the approved maintenance schedule.

4. Temporary irrigation equipment, measures, and systems to be maintained and irrigation provided throughout the Guarantee Period. The Contractor shall be responsible for the health of the plantings, and is responsible to provide optimal watering for the establishment of all plantings during the guarantee period. All work injured or damaged due to the lack of water, or the use of too much water shall be the Contractor's responsibility to correct.

C. Replacements:
During the Guarantee Period, the Contractor will replace, at no additional cost to the City of New York, any and all plant material which has died or which is, in the opinion of the Commissioner, in unhealthy or unsightly condition.

1. All replacements shall be in accordance with original Specification.

2. Cost of replacement is considered to be included in the Contract price.

3. Replace unacceptable plant material no later than the next succeeding planting season.

4. All areas damaged or soiled by replacement planting operations are to be fully restored to their original condition at no additional cost to the City of New York.

D. Final Acceptance:
Approximately one month prior to the expiration of the Guarantee Period, the Contractor shall arrange a site inspection by the Commissioner, for the purpose of final acceptance.

1. At this time the Commissioner will prepare a list of all remedial work required, including plant replacement or maintenance.

2. This work shall be carried out before the end of the Guarantee Period, unless weather conditions cause delays, in which case such work shall be carried out as soon as is practical.

3. Following the completion of all remedial work and replacement plantings, the Contractor shall request the Commissioner in writing for a formal inspection of the landscape work for Final Acceptance.

4. If replacement plantings are required, Final Acceptance will be provisional upon a final inspection at the end of the Guarantee Period for the plant replacements.

E. All of the materials and labor required for maintenance and replacements during the Guarantee Period shall be included in the bid price.

PART II - PRODUCTS

2.1 PLANT MATERIAL

A. Provide plant material to meet or exceed applicable AAN standards in all ways, in addition to other standards specified.
   1. Plants shall be typical of their species or variety with normal habits of growth, in accordance with ASNS: Sound, healthy and vigorous, well-branched and densely foliated when in leaf, free from disease, insect pests, eggs or larvae with healthy well developed root systems.

B. Sources:
Nursery sources of supply shall have been investigated by the Contractor to confirm that size, variety, and quantity of plant material specified on Plant List can be supplied.
   1. Failure to take this precaution will not relieve the Contractor from the responsibility for furnishing and installing all plant material in strict accordance with the Contract requirements and without additional expense to the City of New York.

C. All plants shall conform to the following requirements:
   1. Plants shall be true to species and cultivar specified.

   2. All plant material shall be nursery grown in accordance with good horticultural practice, for at least two years under climatic conditions and soils similar to those at job site.

   3. No plant material shall be collected or harvested from non-nursery areas.

   4. All trees shall be freshly dug for this project.

   5. All trees shall have straight trunks with leader intact, undamaged and uncut.

   6. Trees with a damaged or crooked leaders, bark or abrasions, sunscald, disfiguring knots, insect damaged will not be accepted.

   7. Depth of planting must be checked on all trees being tagged at the nursery. Remove all soil or other fill material above the natural point where the tree trunk begins to spread, (the flare), prior to digging and ball and burlap operations

D. Size:
   1. Caliper measurement shall be taken on the trunk at 6" above the natural ground line for trees up to and including 4" in caliper, and 12" above the ground for trees greater than 4" in caliper.

   2. Height and spread dimensions refer to the main body of plant, and not from branch tip to tip.

   3. If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the maximum size specified.

4. Plants that meet measurements but do not possess a normal balance between height and spread shall be rejected.

5. Plants larger than specified may be used only if approved by Commissioner. Use of such plants shall not increase the contract price. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant.

6. Contractor shall verify that size of root ball will fit in prepared planting pits.

E. All trees shall be balled and burlapped stock (B&B), with a compact natural ball of earth, firmly wrapped and tied in burlap fabric.
   1. Root ball sizes shall be in accordance with standards specified in ASNS.

   2. Plants with cracked or broken rootballs will not be accepted.

   3. Only natural burlap fabric shall be acceptable for balling. Plastic and other non-biodegradable fabrics will not be accepted.

2.2 TREE ANCHORING MATERIALS

A. All trees shall be secured using a guy wire and in-ground anchor system specifically designed for the securing of trees.
   1. System shall consist of three galvanized anchors, 3/16" tensioning cable and tension strap with ratchet tensioner at each tree.
   2. Use anchoring system sized to the tree caliper. Trees over 3 inch caliper or larger shall be anchored using heavy duty system.

2.3 MULCH

A. Mulch shall be double-shredded hardwood bark, as approved. Mulch shall be partially decomposed, dark brown in color, free from sawdust, and any material over two (2) inches in length.

B. Mulch from trees removed from site will be acceptable for use provided it meets the requirements specified herein.

2.4 WATER-ABSORBENT POLYMER

A. Acceptable products:
   1. Supersorb, as manufactured by Aquatrols of America, Pennsauken, NJ 08110. Tel: (800) 257-7797.

   2. Terrasorb, as manufactured by Industrial Services International, Bradentown, FL 34282. Tel: (800) 277-6728.

   3. Agrosoke, as manufactured by Grosoke International Inc., Fort Worth, TX 76118. Tel: (800) 522-0696.

4. Or approved equal.

2.5 DRAINAGE GRAVEL

A. Drainage gravel shall comply with the requirements of Drainage Fill as specified in Section 312323: Backfilling.

2.6 FERTILIZER FOR TREES

A. Tree fertilizer shall be 21-gram biological fertilizing tablets (12-8-8) containing Nitrogen-fixing and Phosphorus-solubilizing bacteria, natural humates, fertilizer and slow-release organic nutrients for sustainable plant growth. Each tablet shall provide slow-release fertility for up to two years.

2.7 BIO-STIMULANT FOR TREES

A. Bio-stimulant for trees shall be a mycorrhizal inoculant in granular form containing both Endo and Ectomycorrhizal fungi to colonize the roots of trees and shrubs when applied to the root zones of plants at planting time. Packets shall contain, as a minimum: one thousand (1000) live spores of Vesicular-Arbuscular fungi, including: Entrephosphora columbiana, Glomus clarum, Glomus etunicatum, and Glomus sp.; seventeen million five hundred thousand (17,500,000) live spores of Ectomycorrhizal fungi, including: Pisolithus tinctorius; biostimulants including Yucca schidigera extract; soluble sea kelp extract derived from Ascophylum nodosum; humic acids; and acrylamide copolymer gel as a water absorbent medium

2.8 FERTILIZER FOR SHRUBS, GROUND COVERS & PERENNIALS

A. Fertilizer for shrubs and perennials shall be a combined fertilizer and bio-stimulant, consisting of a granular, organic fertilizer and soil conditioner, with beneficial mycorrhizal fungi and nitrogen-fixing, phosphorous solubilizing bacteria.

2.9 FOLLOW- UP BIO-STIMULANT

A. Follow-up Bio-Stimulant shall be a dry, soluble product containing 3-0-20 fertilizer, microbial nutrients, and microbial inoculant treatment with humic acids.

2.10 GEOTEXTILE

A. Geotextile shall be a non-woven synthetic fabric such as:
   1. FX-60HS, manufactured by Carthage Mills, Cincinnati, OH
   2. 160N, manufactured by Mirafi, Inc., Charlotte, NC
   3. TerraTex N06, manufactured by Hanes Geo Components, Edison, NJ
   4. Or approved equal.

B. Geotextile shall conform to the following requirements:

Grab tensile strength	120 lbs min.	ASTM D4632
Grab tensile elongation	55% max.	ASTM D4632
Burst strength	210 psi min.	ASTM D3786

PART III - EXECUTION

3.1 INSPECTION

A. Contractor shall inspect the site before bidding to determine the characteristics of the site. It shall be the Contractor's responsibility to determine what measures may be needed to assure healthy plant growth, including:
   1. Removal of unsuitable material.
   2. Provision of extra planting soil mixes.
   3. Addition of soil improvers.
   4. Addition of drainage piping, porous fill or other materials.

B. The Contractor shall be responsible for any and all damage to surrounding areas caused by planting operations and shall be required to restore or replace the damage to its original condition.

3.2 UTILITIES

A. Contractor is responsible for determining the location of all utilities, by contacting the appropriate utility company prior to any construction.

B. Verify that underground utilities in landscape areas are in place, at proper location, tested and ready for use.
   1. Take proper precautions so as not to disturb or damage sub-surface elements.
   2. Coordinate with other trades.

C. Contractor is responsible for any damage to such utilities during the course of construction, and is responsible for making necessary repairs to damaged utilities at his own expense.

3.3 PLANTING DATES

A. Plant only within the following dates, weather permitting. Do not plant in times of high wind, rain, sleet or snow, or when the ground is frozen, excessively wet or the soil is otherwise in an unsatisfactory condition for planting.
   1. Planting at times other than those specified will be at the Contractor's own risk, and will not invalidate any Guarantees.

B. B & B Deciduous trees and shrubs:

Spring: March 1 to May 15.
Fall: October 15 to December 15.

C. B & B Evergreen trees and shrubs:
Spring: March 15 to May 15.
Fall: September 1 to December 1.

The following trees shall be planted during the spring season only:

Abies.	*Betula*	*Carpinus.*	*Celtis.*
Cercidiphyllum.	*Cornus florida.*	*Crataegus*	*Fagus.*
Ginkgo.	*Halesia.*	*Ilex opaca.*	*Koelreuteria.*
Larix.	*Liquidambar.*	*Liriodendron.*	*Malus.*
Nyssa.	*Ostrya.*	*Prunus.*	*Pyrus*
Quercus.	*Salix.*	*Tilia tomentosa*	*Tsuga.*
Zelkova			

D. Container-grown perennials, vines, and ground cover plants:
Spring: March 15 to June 15.
Fall: September 15 to November 15.

3.4 DRAINAGE

A. Drainage at tree pits and planting beds:
Check drainage at tree pits and planting beds prior to planting, by performing percolation tests (in dry weather) as follows:
1. Dig out planting hole to required depth and fill hole half full of water. Mark water level with stake.
2. Water level should decrease by a minimum of two (2) inches per hour.
3. If water does not drain adequately from plant pits, amend conditions at tree pits and planting beds as required for satisfactory drainage. Amendments may include:
   a. Removal of unsuitable material.
   b. Provision of drainage gravel or extra planting soil mixes.
   c. Addition of drainage piping or other materials.
4. Obtain approval of Commissioner for proposed amendments.
5. Do not install plants until drainage conditions are approved by the Commissioner

B. At all areas where planting beds are located over concrete slabs or footings, install a minimum of 6 inches depth of Drainage Fill over the concrete slab.
1. Drainage Fill shall conform to the requirements of Section 312323: Backfilling.
2. Install geotextile between Planting Soil Mix and Drainage Gravel.

3.5 PREPARATION FOR PLANTING

A. Planting Soil Mix materials and installation shall be as specified in Section 329320: Planting Soil Mix.

B. Exercise extreme caution during excavation to avoid damaging or interrupting existing underground utilities. Use appropriate detection equipment to locate utilities during excavation for planting.

C. Erect barricades, warning signs, or other protective devices as may be required by local, state, or federal laws and regulations, or as directed by Commissioner, to protect open excavations.

3.6 PLANT INSTALLATION

A. Do not plant until plant material has been approved by the Commissioner at site.

B. Placement of Plants:
   1. Plants shall be set in the center of pits, plumb and straight, in accordance with the planting details, and faced to give best appearance and relationship to adjacent plants and structures.

   2. Plant to such depth that the finished grade level of plant, after settlement, will be the same as that at which the plant was grown.

   3. Trees must be planted at the depth of the flare, where roots spread from the trunk. The flare must be located and placed at the correct level before continuing planting operations.

3.7 TREE PLANTING

A. Planting balled and burlapped trees:
   1. Excavate plant pits to minimum dimensions shown on the Drawings. If plant pits are mechanically dug, the sides of the pit shall be broken down or roughened with a shovel or other hand tool to eliminate surface glazing.

   2. Remove all platforms and surplus binding from top and sides of ball.

   3. Position plants in center of pit, using gentle handling to avoid damage to any part of plant.

   4. Set plants on compacted soil, to position at the correct depth, as shown on the Drawings.

   5. If wire baskets are used to contain the root ball, these shall be entirely removed before planting.

   6. Fully remove all twine, ties, and other packing materials.

   7. Cut and remove all burlap from the upper half of root ball.

8. Fold and adjust remaining burlap to expose the maximum area of the root ball, in a manner to prevent the formation of air pockets. When directed by the Commissioner, the burlap shall be entirely removed.

9. If non-biodegradable wrapping is used in place of burlap, this shall be entirely removed before planting.

10. Cleanly cut off all visible broken or frayed roots.

B. Backfilling:
Fill plant pit with specified soil mix by hand, in layers of not more than six inches (6") depth, and with each layer thoroughly settled by hand tamping and with water, and free of all voids before next layer is put in place.

C. Saucering:
After backfilling is completed, a saucer shall be made for the retention of water around each tree, unless impracticable due to placement of tree gratings or other paving material over planted area.
1. The saucer shall be of the same diameter as that of the hole dug.

2. The lip shall be level all around and shall be at least 3 inches high.

D. Do not use tree wrap.

3.8 TREE ANCHORING

A. Install tree anchoring system in accordance with the manufacturer's instructions. Use hand drives or power drive equipment as required for each type of anchor system.
1. Ensure that anchor is in the locked position after final installation.

2. Ensure that tension straps lie flat over root ball with no twisting, and that straps are located at the root ball edges, not in contact with the tree trunk or flare.

3. Protect tree root balls from damage by installation equipment or procedures.

3.9 TREE FERTILIZER

A. Application of Fertilizer and Bio-Stimulant at trees:
The Contractor shall provide one (1) application of Fertilizer and Bio-stimulant to all trees, during the initial planting operation of each tree.

B. Fertilizer tablets shall be applied in the quantities as follows:

Tree Rootball Diameter:	Quantity of 21-Gram Tablets Required:
18" - 28"	5 Tablets
29" - 38"	6 Tablets
39" - 48"	7 Tablets

49" - 58"	8 Tablets
59" - 68"	10 Tablets
Over 69"	12 Tablets

C. Bio-stimulant shall be applied in the quantities as follows:

Tree Rootball Diameter:	Quantity of 3-Ounce Packets Required:
18" - 28"	2 Packets
29" - 38"	3 Packets
39" - 48"	4 Packets
49" - 68"	5 Packets
69" - 78"	6 Packets
Over 78"	7 Packets

D. Application Method:
The fertilizer and bio-stimulant shall be incorporated into the top 6" of soil mix backfill at the tree pit, as follows:

1. Backfill plant pit to within 6" of finished grade.

2. Evenly place the fertilizer tablets around the outside edge of the root ball.

3. Evenly spread the contents of the bio-stimulant packets in a "doughnut shaped" ring up to 8" wide around the outside edge of the root ball.

4. Backfill to finished grade with soil mix as specified, and mix backfill by hand to blend bio-stimulant into soil mix.

5. Compact soil mix and water to soil saturation.

3.10 PLANTING SHRUBS, PERENNIALS & ORNAMENTAL GRASSES

A. All plants shall be planted in continuous planting beds, not in individual pits, unless otherwise shown on the Drawings.

B. Prepare planting beds to depths as shown on the Drawings, and fill with improved soil mix as specified in Section 329320: Planting Soil Mix.

C. Plant holes for container plants:
Excavate plant holes within prepared bed, to depth of container and twice the container diameter.

D. Plant holes for balled and burlapped plants:
Excavate hole to twice the diameter of the rootball.

E. Planting:

1. Balled and burlapped plants: Immediately prior to planting, carefully remove all burlap, wire baskets, twine or other ties from balled and burlapped shrubs, to expose the root ball.

2. Container grown plants: Immediately prior to planting, carefully remove plant from container using gentle handling to avoid damage to any part of plant.

3. Keep plant roots protected from drying effects of wind and sun at all times prior to planting. Water or heel-in as necessary.

4. If roots are loose, spread roots out evenly over a mound of soil mix.

5. If roots are tight and compact, loosen by pulling gently apart. If plant roots will not separate, use a sharp tool to make vertical slits in the root ball, approximately 2" deep at three or four locations around root mass.

6. Set plants on a bed of compacted soil mix as specified, so that the top of the root ball will be level with the finished surface of the soil.

F. Backfilling:
1. Fill plant pit with soil mix by hand, pushing the mix around and just over the surface of the root ball.

2. Add soil mix in layers of not more than four inches (4") depth, and with each layer thoroughly settled by hand tamping and with water, and free of all voids before next layer is put in place.

G. Application of fertilizer and bio-stimulant at planting beds:
The Contractor shall provide one (1) application of fertilizer/bio-stimulant to all plant pits, during the initial planting operations.

1. Fertilizer/Bio-Stimulant shall be incorporated into the top 6" of soil mix, as per the manufacturer's directions and as follows:

Plant Container Size	Application Rate (Per 4 Ounce Scoop):
1 Gallon	One Scoop (4 ounces)
2 Gallon	One Scoop (4 ounces)
3 Gallon	Two Scoops (8 ounces)
5 Gallon	Two Scoops (8 ounces)

H. Application Method:
The fertilizer/bio-stimulant shall be incorporated into the top 6" of soil mix backfill at the plant beds, immediately following planting, as follows:
1. Backfill plant bed to within 6" of finished grade.

2. Evenly mix the fertilizer/bio-stimulant into the soil mix around each plant, following the application rates shown above.

3. Backfill to finished grade with soil mix as specified, and mix backfill by hand to blend bio-stimulant into soil mix.

4. Compact soil mix and water to soil saturation.

3.11 WATERING

A. Immediately after installation of each plant, the soil around it shall be thoroughly saturated with water.
   1. Apply water slowly so as to penetrate the entire root system.

   2. Watering shall continue throughout the maintenance period, as frequently as seasonal conditions require, until final acceptance of the work.

3.12 MULCHING

A. After planting operations are complete all tree pits and plant bed areas shall be covered with approved mulch.

B. Mulch shall be installed at an even depth of three (3) inches.
   1. Mulch shall be contained within the plant bed areas and shall not be permitted to spread onto paved areas.

3.13 PRUNING

A. Perform pruning following planting, only as necessary to remove all dead wood, suckers, and broken or badly bruised branches.

B. Pruning shall be done with clean, sharp tools. No leaders shall be cut.
   1. Each cut shall be made carefully, at the correct location, leaving a smooth surface with no jagged edges or torn bark. The correct anatomical location is just beyond the branch collar.

   2. Large or heavy limbs should be removed using three (3) cuts. The first cut undercuts the limb one or two feet from the parent branch or trunk. The second cut is top cut which is made slightly further out on the limb than the undercut. The third cut is to remove the stub.

3.14 ANTIDESICCANT SPRAYING

A. Use antidesiccant only as approved by Commissioner. Approval is required for each condition of use.

3.15 PLANT PROTECTION

A. The Contractor shall provide at his own expense any and all protection measures necessary to protect all plants and lawn areas against damage prior to Final Acceptance of the work.

B. Removal of Temporary Protection Measures:
Any temporary protection measures employed during the construction period shall be removed prior to Substantial Completion unless otherwise directed by the Commissioner.
1. Any guys, wires, tree straps, rubber hose sections or stakes used for temporary bracing of trees or any tree trunk wrapping shall be removed and disposed of by the Contractor off site at his own expense at the end of the Guarantee Period, or earlier at the direction of the Commissioner.

3.16 PLANT MAINTENANCE

A. Maintenance of all plant material shall begin immediately after planting, and continue until the end of the Guarantee Period, unless otherwise noted.

B. Defective work shall be corrected as soon as possible after it becomes apparent and weather season permits. The Commissioner shall be the sole judge of the condition of the plants.

C. Maintenance shall include:
1. The removal of all dead, dying or unhealthy plant material, and replacement of such material with new plants or lawn seed to meet all specifications of the original plantings.

2. The repeating of any or all phases of planting work as specified herein, or which may be required to obtain healthy plantings.

D. Maintenance Program:

1. Contractor shall arrange a meeting with the Commissioner, and with Commissioner's designated maintenance personnel to review together the submitted maintenance program and any modifications required for the duration of the Guarantee Period.

2. The Contractor shall make periodic inspections, at no extra cost, during the Guarantee Period to determine what changes, if any, should be made in the maintenance program.

3. Any recommended changes shall be submitted in writing to the Commissioner.

4. Additional remedial work not included in the maintenance program shall be carried out by the Contractor as deficiencies are identified and reported by the Commissioner or designated maintenance personnel.

5. The Contractor shall replace, without cost, as soon as weather conditions permit, and within a specified planting period, all plants determined dead and/or dying by Commissioner's designated maintenance personnel during and at the end of the Guarantee Period.

6. Plants shall be free of dead or dying branches and shall bear foliage of normal density, size, and color.

7. Trees having lost their central leader or exhibit crown dieback at the end of the guarantee period shall be replaced.

8. Replacements shall match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Labor and all materials needed for installation of replacements shall be included in the guarantee.

E. Maintenance Tasks:
Maintenance shall include, but not be limited to the following:

1. Irrigation:
Water trees and all other planted areas as required using temporary or permanent irrigation equipment. Plants shall be inspected by the Contractor for watering needs at least once each week, and watered as necessary to promote optimum plant growth and vitality. Maintain and adjust temporary irrigation measures as required to provide uninterrupted schedule of optimal irrigation. The Contractor's responsibility for watering shall terminate at the end of the Guarantee Period.

3. Weeding:
Weed to keep all planted areas weed-free throughout the Guarantee Period.

4. Mulching:
Add mulch material as required to maintain mulch at specified depth.

5. Pruning:
Prune trees and shrubs to remove all dead or broken branches, throughout the Guarantee Period. Prune flowering shrubs as necessary to ensure flowering. Prune hedges as required to promote dense, even growth. Prune and/or cut-back vines as described herein, if deemed necessary by the Commissioner.

6. Trimming:
Cut back dead stalks, flowers and foliage from perennials in fall after the first frost. Trim or deadhead spent flower blossoms throughout the Guarantee Period.

7. Resetting:
Reset plant material which has settled, to proper grade and position.

8. Anchoring:
Maintain tree stakes, guys and other tree anchoring systems, including tightening, repair or replacement as required, and removal at the end of the Guarantee Period, or as directed by the Commissioner.

9. Rodents:
Protect against and exterminate rodents, and repair of any damage caused by rodent activities.

10. Fertilizers:

Apply fertilizers, pesticides and fungicides as required, or as directed by the Commissioner, to keep all lawns and plantings healthy and pest-free throughout the Guarantee Period.

11. Follow-up Bio-Stimulant Application:
    a. Apply follow-up applications of Bio-Stimulant to all trees, shrubs, ground covers and perennials, on the following dates:
        Two months after the initial planting.
        Four months after the initial planting.
        Six months after the initial planting

    b. Apply Bio-Stimulant as per manufacturer's directions and as follows:
    Mix one (1) pound of Bio-Stimulant powder / 100 gallons of water.

    All tree planting pits and shrub beds shall be watered with mix to thoroughly saturate soil.

12. Instruct Commissioner's maintenance personnel in all maintenance procedures required after end of Guarantee Period.

3.17 CLEAN UP

A. At the end of each workday the Contractor shall broom-clean the site, to remove all trash, debris, and loose soil materials. Store materials and equipment where directed.

B. Immediately following the completion of planting operations, the Contractor shall remove all excess materials, stockpiles, waste material, tools and equipment, and leave the site in a clear and clean condition.

C. Immediately remove all rejected materials from the site. All rejected materials and other waste or debris shall become the property of the Contractor, who shall legally dispose of same off-site.

END OF SECTION

SECTION 33 05 13
SANITARY AND STORM SEWER STRUCTURES

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.

B. Related Work specified in other sections includes, but is not limited to, the following:

1.	Specification 01 45 50	-	Cast-In-Place Concrete
2.	Specification 05 56 00	-	Metal Castings
3.	Specification 31 23 16	-	Excavation – Earth and Rock
4.	Specification 31 23 23	-	Backfilling

1.2 SECTION INCLUDES

A. Requirements for furnishing and installing precast and cast-in-place concrete drainage structures including, but are not limited to: manholes, inlets, catch basins, trench drains, area drains, pipe cradles and encasements, splash pads and other structures in sanitary sewers and storm sewers including all appurtenances.

1.3 REFERENCES

A.	ASTM C32	-	Sewer and Manhole Brick (Made for Clay or Shale)
B.	ASTM C39	-	Compressive Strength for Cylindrical Concrete Specimens
C.	ASTM C 76	-	Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
D.	ASTM C78	-	Flexural Strength of Concrete
E.	ASTM C139	-	Concrete Masonry Units for Construction of Catch Basins and Manholes
F.	ASTM C140	-	Methods of Sampling and Testing Concrete Masonry Units
G.	ASTM C144	-	Aggregate for Masonry Mortar

H. ASTM C279 - Chemical-Resistant Masonry Units

I. ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric)

J. ASTM C478 - Precast Reinforced Concrete Manhole Sections

K. ASTM C666 - Freeze Thaw Stability of Concrete Specimens

L. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

M. AWWA C302 - Reinforced Concrete Pressure Pipe, Non-Cylinder Type

N. New York City Department of Environmental Protection (NYCDEP) Sewer Design Standards

1.4 SYSTEM DESCRIPTION

A. Engineering Requirements

1. Except as otherwise shown or specified, construct sewer manholes and catch basins of precast reinforced concrete sections conforming to ASTM C478.

2. Unless otherwise shown, manholes and catch basins shall be built in accordance with the Sewer Design Standards of the NYCDEP, except that they shall be constructed without steps.

1.5 SUBMITTALS

A. Shop Drawings: Submit shop drawings of sewer manholes as specified in the the DDC General Conditions.

B. Quality Control: Submit shop and field test reports of concrete samples tested in an approved laboratory.

1.6 DELIVERY, STORAGE AND HANDLING

A. General: Take every precaution to prevent injury to the manhole sections during transportation and unloading. Unload manhole sections using skids, pipe hooks, rope slings, or suitable power equipment, if necessary, and keep the sections under control at all times. Do not allow the manhole sections to be dropped, dumped or dragged under any conditions. Follow applicable requirements specified in the DDC General Conditions.

B. Damaged Section: If any manhole section is damaged in the process of transportation or handling, reject and immediately remove such sections from the site, and replace the damaged manhole sections at no increase in Contract Amount.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted as an "or approved equal".

B. Precast Manholes:
1. Monarch Precast Concrete Corp.
2. Precast Concrete Sales Company
3. Long Island Precast, Inc.

C. Precast Inlets:
1. Monarch Precast Concrete Corp.
2. Rotondo/Penn-Cast Products, Inc.
3. Precast Concrete Sales Company

D. Precast Catch Basins:
1. Monarch Precast Concrete Corp.
2. Rotondo/Penn-Cast Products, Inc.
3. Long Island Precast, Inc.
4. Precast Concrete Sales Company

E. Stormwater Retention System:
1. StormTech
2. CONTECH
3. CULTEC, Inc.

2.2 MATERIALS

A. Concrete, Steel Reinforcement and Aggregates: For precast manholes, catch basins, inlets, and other sanitary and storm sewer structures, reinforced concrete, cementitious materials, aggregates and steel reinforcement shall conform to the requirements of ASTM C478. If concrete rings are used for adjusting manhole frames to grade, they shall conform to the requirements of ASTM C139. For cast-in-place structures, these materials shall conform to Division 3 requirements.

B. Brick: Provide brick conforming to ASTM C 32, Grade MS, with minimum dimensions of 2-1/4 by 3-1/2 by 7-1/2 inches, for adjusting manhole frames to grade. Furnish brick that is new, solid, sound, hard burned throughout and uniform in size and quality.

C. Mortar: Provide mortar that is composed of one part portland cement or Portland pozzolan cement to two parts sand.

D. Manhole Frames and Covers: Provide manhole frames and covers as shown that are gray iron and meeting the requirements of Section 05 56 00.

E. O-ring Rubber Gaskets: Provide O-ring rubber gaskets conforming to ASTM C 443 for joining manhole sections.

F. Pipe Connections: Provide resilient connectors conforming to ASTM C923 for making connections between manholes and sewer pipes.

2.3 CONSTRUCTION

A. Manhole Base Section: Unless otherwise shown, provide manhole base sections consisting of a base riser section with an integral floor. When benches are made at the manufacturing site, provide concrete used for benched inverts conforming to the requirements for concrete used for precast sections. When benches are made in the field, Class D concrete may be used.

B. O-Ring Joints: Join riser, cone and flat slab top sections with O-ring rubber gasket joints. Fill voids in the joints completely with mortar after assembly of the sections.

2.4 SOURCE QUALITY CONTROL

A. Concrete Strength: Manhole sections will be inspected and tested by an independent, certified testing laboratory, retained by the COMMISSIONER, to establish the strength of the concrete and the adequacy of curing, to certify the date that the sections were cast and to confirm that the reinforcing steel has been properly placed. This inspection and testing will be performed by the laboratory at the manufacturing plant prior to shipment.

1. At least three cylinders will be taken each day that manhole sections are cast, with batch samples to be designated by the laboratory representative. At least one set of cylinders will be taken from each 9 cubic yards of concrete used in manhole section construction. These samples will be tested for strength. If the samples fail to meet specified minimum concrete strength requirements, all manhole sections manufactured from the concrete from which the cylinders were made will be rejected.

2. The COMMISSIONER reserves the right to core manholes either at the job site or point of delivery to validate strength of concrete and placement of steel. If cores fail to demonstrate the required strength or indicate incorrect placement of reinforcing steel, all sections not previously tested will be considered rejected until sufficient

additional cores are tested, at no increase in Contract Amount, to substantiate conformance to these requirements.

B. Acceptance: Base acceptance of flat slab tops passing a proof-of-design test in accordance with ASTM C 478.

2.5 PRECAST PRODUCTS

A. Unless otherwise shown or specified, precast concrete products shall be used for sanitary and storm sewer structures.

B. The number of joints in manhole and catch basin riser sections shall be kept to a minimum by using sections 8'-0" long in so far as possible. Joints shall be tongue and groove type conforming to AWWA C302, with continuous steel reinforcement in the tongue and bell.

C. Wet-cast methods only shall be used. Forms shall leave the surfaces smooth and free of irregularities or honeycombing.

D. Unless otherwise shown or specified, the following design loadings shall be used with 30 percent impact allowance in roads and 15 percent elsewhere.

1. Earth = 130 PC
2. Wheel = H-20

E. Unless otherwise shown or specified, wall thickness for manholes and catch basins shall be not less than:

1. 5 inches for walls
2. 8 inches for top slab

F. No more than two (2) tapered lifting holes shall be provided per section of manhole or lifting holes shall be filled with tapered rubber plugs.

G. The point of intersection (P.I.) of pipes shall be marked with a pin in the manhole floor.

H. The date of manufacture and the manufacturer's trademark shall be marked inside each manhole and catch basin barrel.

2.6 STORM WATER RETENTION SYSTEM

A. Detention/Infiltration system shall consist of plastic, open-bottom, arch-shaped chambers designed to store stormwater runoff and/or infiltration stormwater runoff into surrounding soils. The manifold pipe and chambers shall be provided by a single manufacturer

specializing in the production of these chambers for stormwater retention and installed in accordance with the manufacturer's installation guide.

B. The chambers shall be constructed of injection molded polypropylene copolymer formulated for high impact and stress cracking resistance and sustained structural performance during high temperatures. The chamber shall be designed and manufactured in accordance to ASTM F-2418 and F-2787.

C. The chamber shall be designed to AASHTO LRFD Bridge Design Specifications (Section 12), as applied to material and performance requirements for buried thermoplastic pipes. Design live load shall be the AASHTO HS-20 and HS-25 Truck, including multiple lane presence factors, over a minimum cover of 18 inches and chamber row spacing of 5 inches or greater.

D. The chamber system shall be comprised of three chamber configurations: the middle chambers shall be open-ended to allow unobstructed hydraulic flow, inspection, and maintenance. The start and end chambers shall each have an integral end wall designed to resist loading at the start and end of the chamber rows. The chambers within a row shall be installed with overlapping end corrugations.

E. The chamber shall have a continuously-curved, arch-shaped section profile.

F. Provide scour protection netting to extend 1'-0" beyond outside edge of inlet chambers.

G. The start and end chamber integral end wall shall be structurally suitable for cutting and inserting inlet pipes and shall provide a range of pipe diameter indicants up to 24-inch diameter as cutting templates.

H. The chamber shall be a corrugated, open-bottom design with 0.4-inch wide and 1.5-inch tall slotted side wall openings for lateral flow and top vent orifices for hydraulic pressure equalization. Corrugation valleys and crests shall be sub-corrugated to increase stiffness.

I. The chamber shall be supported by integral structural footing comprised of load dispersing toe ribs and longitudinally aligned stiffening ribs.

J. Provide a minimum of four inspection ports, the two chambers of storm retention structure. Location of inspections ports shall per manufacturer's recommendation.

K. Provide a 6-inch cleanout at downstream end of storm retention structure adjacent to inlet structure.

PART III - EXECUTION

3.1 INSTALLATION

A. Excavation and Backfill: Perform excavation and backfill in accordance with Section 31 23 16 and 31 23 23.

B. Manhole Frames: Firmly embed manhole frames in mortar. Provide wedges or shims for accurate and level placing of the frames.

C. Precast Items

1. Place structure on select fill bed or concrete pile cap and set level as shown:

   a. Where pile supports are required, set structure on the pile cap as shown on the Contract Drawings.

   b. Where pile supports are not required, set on six inches of compacted select fill in accordance with Section 31 23 23 – Backfilling.

2. Backfill the area that is excavated adjacent to the structure and under the pipe with select fill to prevent settlement and provide for support for the pipe from the manhole edge to the regular trench excavation.

3. Place backfill in even lifts on all sides to prevent overturning loads.

4. Set structures at the proper grade and alignment to provide a smooth transition from the incoming pipe(s) to the outgoing pipe.

D. Connections to Sewers: Provide connections to sewer pipes in accordance with NYCDEP Sewer Design Standards:

1. Manufacture riser sections with openings properly located for making connections to sewers. The minimum distance between a joint in a manhole section and the nearest edge of an opening for a connecting sewer and the diameter of such openings shall be as shown in the NYCDEP Sewer Design Standards.

2. Provide a connection between the structure and the pipe that is watertight and an invert that is smooth and continuous as it enters and exits the manhole. Sewer pipe shall not protrude into the trough of the manhole.

3. Join inlet and outlet pipes to the structure with a flexible watertight connection. Seal pipe in the structure openings with a resilient connector meeting the requirements of ASTM C923. Resilient connector shall be cast integrally into the wall of the manhole section at time of manufacture, or, shall be installed by mechanical means in openings cut into manhole wall per ASTM C 923.

E. Coatings: Precast structures below grade shall be coated with coal tar epoxy applied in two (2) coats, eight (8) mils each.

F. Laying Masonry

1. Bricks shall be wetted before applying mortar.

2. Full bed, end and side joints shall be formed in one operation.

3. Horizontal joints shall be 3/8 inch maximum and radial joints shall be 1/4 inch maximum.

4. Keyways shall be completely filled with mortar.

5. The total amount of adjustment by bricks or concrete rings shall not exceed 12 inches.

G. Stubs for Future Connections: Where shown, provide stubs or bells cast in walls and provide approved plugs or caps.

H. Grading

1. Manholes and catch basins shall be installed such that covers will be at final grade.

2. Structures shall not project above finished pavements.

3. Structures in areas with temporary working grades shall be initially installed to match the temporary grade, and adjusted later to final grade prior to regrading.

4. Contractor shall be responsible for setting structures to the proper grade. The COMMISSIONER's review will be general and will apply to components only.

3.2 LEAKAGE TESTS

A. Test the structures for leakage after installation in accordance with Section 01 45 50 - Leakage Tests.

END OF SECTION 33 05 13

SECTION 33 05 50
LAYING AND JOINTING BURIED PIPELINES

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.

B. Related Work specified in other sections includes, but is not limited to, the following:

1.	Section 01 45 50	-	Leakage Tests
2.	Section 31 23 16	-	Excavation – Earth and Rock
2.	Section 31 23 23	-	Backfilling
2.	Section 33 13 00	-	Disinfection

1.2 SECTION INCLUDES

A. Installation of all underground pipelines. Provide pipeline materials, coatings and linings as specified and pipe of the types, sizes and classes shown or specified.

1. Use proper and suitable tools and appliances for the safe and convenient cutting, handling, and laying of the pipe and fittings.

2. Use suitable fittings where shown and at connections or where grade or alignment changes require offsets greater than those recommended and approved.

3. Lay all underground pipelines not supported on piles or concrete cradle in select fill bedding material.

4. Close off all lines with bulkheads when pipe laying is not in progress.

1.3 REFERENCES

A.	ASTM C 12	-	Practice for Installing Vitrified Clay Pipe Lines
B.	ASTM D 2774	-	Practice for Underground Installation of Thermoplastic Pressure Piping
C.	AWWA C600	-	Installation of Ductile-Iron Water Mains and Their Appurtenances

D. ASTM C 361 - Specification for Reinforced Concrete Low-Head Pressure Pipe

E. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60000 psi Tensile

F. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, C25, 125, 250, 800

G. ASME B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges

H. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

I. ASTM A 139 - Duplicate Entry, Specification Section 33 05 23

J. AWWA C115/A21.15 - Flanged Ductile-Iron Pipe With Threaded Flanges

K. AWWA C206 - Field Welding of Steel Water Pipe

L. ASTM E 165 - Practice for Liquid Penetrant Examination

M. ASTM E 709 - Practice for Magnetic Particle Examination

1.4 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products and materials as specified in the DDC General Conditions.

B. Transportation and Delivery: Take every precaution to prevent injury to the pipe during transportation and delivery to the site.

C. Loading and Unloading: Take extreme care in loading and unloading the pipe and fittings.

1. Work slowly with skids or suitable power equipment, and keep pipe under perfect control at all times.

2. Under no condition is the pipe to be dropped, bumped, dragged, pushed, or moved in any way that will cause damage to the pipe or coating.

D. Sling: When handling the pipe with a crane, use a suitable sling around the pipe.

1. Under no condition pass the sling through the pipe.

2. Use a nylon canvas type sling or other material designed to prevent damage to the pipe and coating.

3. When handling reinforced concrete pipe or uncoated steel or ductile iron pipe, steel cables, chain or like slings are acceptable.

E. Damaged Piping: If in the process of transportation, handling, or laying, any pipe or fitting is damaged, replace or repair such pipe or pipes.

F. Blocking and Stakes: Provide suitable blocking and stakes installed to prevent pipe from rolling.

1. Obtain approval for the type of blocking and stakes, and the method of installation.

G. Storage for Gaskets: Store gaskets for pipe joints in a cool place and protect gaskets from light, sunlight, heat, oil, or grease until installed.

1. Do not use any gaskets showing signs of checking, weathering or other deterioration.

2. Do not use gasket material stored in excess of six months without approval.

1.5 FIELD CONDITIONS

A. Repair of Sanitary Sewers and Services: Rebed, in compacted select fill material, sanitary sewers which cross over the new pipe or which cross under the new pipe with less than 12 inches clear vertical separation. Compact the bedding to densities required for new pipeline construction and extend bedding below the sewer to undisturbed earth. Reconstruct sewers damaged by pipeline construction.

1. Furnish and install all materials and do all work necessary for the reconstruction or repairs of sanitary sewers and services.

2. Provide pipe for reconstruction of sanitary sewers and services meeting the appropriate specification requirements.

3. Provide pipe of the same size as the existing sewer or when the same size is not available, use the next larger size of pipe. Obtain approval of joints made between new pipe and existing pipe.

PART II - PRODUCTS

Not Used

PART III - EXECUTION

3.1 PREPARATION

A. Dry Trench Bottoms: Lay pipe only in dry trenches having a stable bottom.

1. Where groundwater is encountered, make every effort to obtain a dry trench bottom.

2. If a dry trench bottom has not been obtained due to improper or insufficient use of all known methods of trench dewatering, then excavate below grade and place sufficient select fill material, crushed stone, or Class D concrete over the trench bottom.

3. If all efforts fail to obtain a stable dry trench bottom and it is determined that the trench bottom is unsuitable for pipe foundation, obtain an order, in writing, for the kind of stabilization to be constructed.

4. Perform trench excavation and backfill in accordance with Sections 31 23 16 and 31 23 23.

3.2 INSTALLATION

A. General: Install all piping in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions.

1. Arrange miscellaneous pipelines, which are shown in diagram form on the Plans, clear of other pipelines and equipment.

B. Code Requirements: Provide pipeline installations complying with AWWA C600 for iron pipe, AWWA Manual M11 for steel pipe, AWWA Manual M9 for prestressed concrete cylinder pipe, ASTM C 12 for clay pipe, ASTM D 2774 for thermoplastic pressure piping 6-inch and smaller, and as modified or supplemented by the Specifications.

C. Pipe Laying - General:

1. For pipelines intended for gravity flow, begin pipeline laying at the low end of a run and proceed upgrade.

2. Generally, lay all pipe with bells pointing ahead.

3. Carefully place each pipe and check for alignment and grade.

4. Make adjustments to bring pipe to line and grade by scraping away or filling in select fill material under the body of the pipe.

5. Wedging or blocking up the pipe barrel is not permitted.

6. Bring the faces of the spigot ends and the bells of pipes into fair contact and firmly and completely shove the pipe home.
7. As the work progresses, clean the interior of pipelines of all dirt and superfluous materials of every description.

8. Keep all lines absolutely clean during construction.

9. Lay pipelines accurately to line and grade.

D. Pipe Laying - Trenches:

1. Lay all pipelines in trench excavations on select fill bedding, Class D concrete cradle or other foundations as shown, specified or ordered in writing.

2. Properly secure the pipe against movement and make the pipe joints in the excavation as required.

3. Carefully grade and compact pipe bedding.

4. Bell Holes:
   a. Cut out bell holes for each joint as required to permit the joint to be properly made and allow the barrel of the pipe to have full bearing throughout its length.

   b. Thoroughly tamp bell holes full of select fill material following the making of each joint.

E. Other Foundations: Install pipelines laid on other types of foundations as specified for such other foundations or as ordered in writing.

F. Concrete Pipeline Joint Finishing: Provide the following finished joints for steel end ring concrete pipelines with rubber gaskets:

1. Exterior Joint Grouting:
   a. Grout joints for concrete pipelines using rubber gaskets and steel end rings on the outside with cement mortar composed of 1 part Type II portland cement to 1 part sand by volume.

   b. Thoroughly mix the materials to produce a uniform mortar with all aggregate particles well coated.

c. In grouting the exterior joint, use a cloth diaper to encase the outside diameter of the bell of the pipe and adequately straddle the joint recess to keep out dirt and to serve as a form for grouting.

d. Fill the joint space with cement mortar which is just thin enough to run around the joint.

e. Leave the diaper in place permanently.

f. Before the mortar has taken its initial set, examine the diaper, and if not completely filled, force additional mortar into the joint.

2. Interior Joint Grouting:
   a. Place cement grout in the interior annular joint opening of all steel end ring concrete pipe for pipe sizes 30 inches and larger in diameter.

   b. Perform interior joint grouting in two phases.

      (1) Immediately following pipe laying.

      (2) After backfilling the entire pipeline is complete.

3. Joints for Concrete Pipelines:
   a. Do not grout joints on the outside of the joint for concrete pipelines using rubber gaskets with all-concrete pipe ends.

   b. Fill the interior annular joint opening with cement mortar and trowel smooth for all pipe 30 inches and larger.

4. Alternative to Grouting:
   a. In place of grouting, use a joint filler consisting of a preformed loop of urethane foam impregnated with unhydrated Portland cement to fill the outside joint recess in prestressed lined cylinder pipe.

   b. Place the loop, sized to fit the spigot end of the pipe, around the spigot ring behind the gasket groove.

   c. Draw the pipe joined as described herein home, compressing the rubber gasket and forcing the urethane foam loop to fill the outside annular joint recess.

G. Ductile Iron Pipe Mechanical Joints:

1. Assembly: In making up mechanical joints, center the spigot in the bell.

a. Thoroughly brush the surfaces with which the rubber gasket comes in contact with a wire brush just prior to assembly of the joint.

b. Brush lubricant over the gasket just prior to installation.

c. Place the gasket and gland in position, bolts inserted, and the nuts tightened fingertight.

d. Tighten the nuts with a torque wrench so that the gland is brought up toward the pipe evenly.

e. Prime all bolts by dipping with a bituminous coating, except the threads. Coat threads immediately prior to installation of nuts.

2. Torques: Apply bolt torques complying with AWWA C600.

3. Remaking of Joints: If effective sealing is not obtained at the maximum torque listed above, disassemble and reassemble the joint after thorough cleaning.

H. Ductile Iron Pipe Rubber Gasket Joints:

1. Assembly: In making up the rubber gasket joint, brush the gasket seat in the socket thoroughly with a wire brush and wipe the gasket with a cloth.
   a. Place the gasket in the socket with the large round end entering first so that the groove fits over the bead in the seat.

   b. Apply a thin film of lubricant to the inside surface of the gasket that will come in contact with the entering pipe.

   c. Brush the plain end of the pipe to be entered thoroughly with a wire brush and place it in alignment with the bell of the pipe to which it is to be joined.

   d. Exert sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket to make the joint.

2. Positioning: Before proceeding with backfilling, feel completely around the joint using a feeler gauge to confirm that the gasket is in its proper position.
   a. If the gasket can be felt out of position, withdraw the pipe and examine the gasket for cuts or breaks.

   b. If the gasket has been damaged, replace it with a new one before re-installing the pipe.

3. Optional Mechanical Joints: Use mechanical joint fittings that meet the requirements of Section 33 05 55 with the rubber gasket joint pipe when specified or when rubber gasket fittings are not available.

I. Concrete Pipe Rubber Gasket Joints: In making O-ring rubber gasketed joints, lubricate the gasket and the pipe socket with an approved rubber gasket lubricant, and stretch the gasket over the spigot and place gasket accurately in position.

1. Carefully center the spigot end in the socket of the preceding pipe to avoid displacement of the gasket and draw the pipe home fully compressing the gasket.

2. Make adjustments to line and grade in such a manner that the compressed rubber gasket will not be disturbed.

J. Steel Pipe Bell and Spigot Rubber Gasket Joints:

1. Assembly: Thoroughly clean the joint surfaces of both the bell and spigot ends before jointing steel pipe with bell and spigot rubber gasket joints.
   a. Stretch a clean rubber gasket, lubricated with an approved rubber gasket lubricant, over the spigot and place accurately in position in the spigot groove.

   b. After the gasket is placed in the spigot groove, adjust the gasket so the tension in the rubber is uniform around the circumference of the joint.

   c. Clean and lubricate the joint surface of the bell end.

   d. Center the spigot end in the bell, being careful to avoid dragging the spigot or displacing the gasket, and draw the pipe home, fully compressing the gasket.

   e. Assemble the joint with the longitudinal axis of the pipe lengths in straight alignment. Deflect joints to make adjustments to line and grade after the joint has been completely assembled. Do not disturb the compressed rubber gasket when deflecting joints.

2. Positioning: Prior to backfilling, feel completely around the joint using a feeler gauge to determine whether the gasket is in its proper position.
   a. If the gasket can be felt out of position, withdraw the pipe and examine the gasket for cuts or breaks.

   b. If the gasket has been damaged, replace it with a new one before re-installing the pipe.

K. Steel Pipe Field Welded Lap Joints: For steel pipe 30 inches in diameter and larger, single weld field welded lap joints on the inside of the joint, except that, where restrained joints are shown, double weld the joints. For steel pipe less than 30 inches in diameter, single weld the field welded lap joints on the outside of the joint. Perform 1/4-inch throat fillet welds with a minimum of two passes. Provide adequate space for welding and inspection of the joints. Perform all welding in accordance with the requirements of AWWA C206.

1. Do all welding with skilled welders experienced in the welding methods to be used and with materials to be welded. Qualify the welding operator under the provisions of AWWA C206 not more than one year prior to commencing work on the pipeline. Use machines and electrodes during qualification tests similar to those used in the work.

2. During welding of the joints, protect the pipe coating to avoid damage to the coating by hot weld spatters. Do not make welding grounds on the coated part of the pipe.

3. Clean all dirt, slag and flux after each pass of deposited weld metal prior to making the next pass.

4. As soon as practicable after welding the joint, test the weld around the entire circumference of the joint by the liquid penetrant test method in accordance with ASTM E 165 or the magnetic particle examination method in accordance with ASTM E 709. Repair any defect disclosed by the test and retest the joint at no additional cost.

L. Steel Pipe Joint Coating: Wrap the exterior of all joints for buried steel pipe with a tape coating in accordance with AWWA C209. Provide tape a minimum of 6 inches wide. Apply tape by technicians certified by the manufacturer. Clean, prime and wrap each joint with two wraps of tape, 30 mils minimum thickness.

M. Ductile Iron Pipe and Steel Pipe Joint Lining: For cement mortar lined ductile iron pipe greater than 30 inches in diameter, fill all interior joint recesses with mortar and make recesses smooth and flush with adjacent pipe interior walls in accordance with AWWA C205, Appendix A.2. For cement mortar lined steel pipe 8 inches in diameter and larger, except sleeve type coupling joints, fill all interior joint recesses with mortar and make recesses smooth and flush with adjacent pipe interior walls in accordance with AWWA C205, Appendix A.2. Use Type II portland cement in mortar for interior joint finishing of wastewater pipelines.

N. Cast Iron Soil Pipe Joints:

1. Joints: Provide joints of lead and oakum or rubber gasket compression type.

a. Thoroughly caulk leaded joints with picked oakum and molten lead.

b. Use twelve ounces of soft pig or bar lead in each joint for each 1-inch of pipe diameter.

c. Pour all lead in at one time.

d. Finish the face of lead joints with the face of the hub and leave without putty, paint or cement.

e. Extend gasket on rubber gasket joints the full depth of the bell and overlap the face of the bell.

2. Connection: Provide leakproof and gastight joints.

O. Temporary Bulkheads: Provide temporary bulkheads at the ends of sections where adjoining pipelines have not been completed, and in connections built into pipelines where adjoining pipelines or structures have not been completed and are not ready to be connected.

1. Remove bulkheads encountered in connecting sewers or structures included in this Contract, or in pipelines or structures previously built, when they are no longer needed or when ordered.

P. Sleeve Type Couplings: For sleeve type couplings, equally tighten diametrically opposite bolts on the connection so that the gaskets will be brought up evenly all around the pipe.

1. Torque Wrenches: Do the final tightening with torque wrenches set for the torque recommended by the coupling manufacturer.

Q. Concrete Cradle

1. General: When a concrete cradle is shown, specified, or ordered in writing, lay the pipe to grade by supporting each section on concrete blocks located near each end.
   a. Shape the tops of the blocks to fit the outside diameter of the pipe.

   b. Set the blocks approximately 3/8 inch low.

   c. Place the pipe on the blocks on a layer of stiff mortar of sufficient thickness to bring the pipes to exact grade.

d. Timber blocking, of a type approved, may be employed in place of concrete blocks.

2. Cradle: Place Class D concrete cradle, on one side only, until it has risen above the invert on the other side, after which deposit the remainder of the concrete on both sides to the pipe spring line.
   a. Prevent movement of the pipe during concrete placement.

R. Concrete Encasement: When concrete encasement is to be provided, as shown, specified, or ordered in writing, lay and block the pipeline and place concrete as specified for concrete cradle.

1. Continue the placing of concrete to provide complete encasement to the dimensions shown, specified, or ordered.

S. Jointing Concrete Pipe:

1. Preparation of Joint Surfaces: Before joining concrete pipe using flexible rubber gaskets, wipe clean the joint surfaces of both the bell and spigot ends.
   a. Repair any lumps, projections, burrs, or chips which would interfere with the proper compression of the gasket.

   b. Insert the spigot end into the bell with the gasket in place and with all surfaces lubricated as recommended.

   c. Apply pressure to seat the pipe properly in the bell.

2. Curve Offset: Construct curves for reinforced concrete pipelines with standard pipe where the opening of the joint on the outside of the curve is less than 1/2 inch.

3. Curve Fittings: Where greater opening of the joint would be required, construct curves using beveled or radius pipe with standard joints, short lengths of pipe, or plain end radius pipe with cast concrete collar joints, or continuous concrete encasement; or by monolithic construction.

T. Jointing Clay Pipe: Joint clay pipe with flexible plastic joints in accordance with the manufacturer's instructions and as specified.

1. Wipe the joint surface clean and coat with lubricant on both the bell and spigot ends.

2. Insert the spigot end in the bell and apply sufficient force to seat the pipe properly.

U. Valve Box Setting: Install valve boxes vertical and concentric with the valve stem.

1. Satisfactorily reset any valve box which is moved from its original position, preventing the operation of the extension valve stem.

2. Replace any extension valve stem which has been damaged so that it can be operated.

V. Jacking:

1. General: Perform jacking as shown. After jacking is completed, seal the ends of the casing pipe with brick masonry.

2. Jacking Pit: Provide jacking pit of adequate length to provide room for the jacking frame, the jacking head, reaction block, the jacks, rig, and jacking pipe.
   a. Construct the pit to be sufficiently wide to allow ample working space on each side of the jacking frame and sufficiently deep so that the invert of the pipe will be at the elevation desired for the completed line when placed on the guide frame.

   b. Tightly sheet the pit and keep it dry at all times.

   c. Provide adequate protective railings at the top of the pit at all times.

3. Jacking Frame: Design the jacking frame so that it applies a uniform pressure over the entire pipe wall area of the pipe to be jacked.

4. Reaction Blocks: Adequately design the reaction blocks to carry the thrust of the jacks to the soil without excessive soil deflection in a manner which avoids any disturbance of adjacent structures or utilities.

5. Hydraulic Jacks: Use hydraulic jacks in the jacking operation, and take extreme care to hold the casing pipe to exact line and grade.

6. Advance Excavation: Advance excavation by augering.

7. Casing Pipe: Furnish steel casing pipe, unless otherwise specified, conforming to ASTM A 139 with wall thicknesses and pipe diameters shown on the Plans. Provide full penetration butt welded pipe joints.

8. Fill Material: Use fill material, consisting of 1-1/4 pounds of Bentonite per gallon of water, during jacking to fill any voids between the casing pipe and the earth.

W. Erection:

1. Anchorage: Place anchorage of pipelines and appurtenances as shown or as ordered.
   a. Accomplish anchorage by placing concrete to the dimensions shown between undisturbed earth and the fitting to be anchored.

2. Valve Setting: Erect valves carefully in their proper positions, free from all distortion and strain, with flanged, mechanical or push-on joints, and pack and leave in satisfactory operating condition.

3. Short Tunnel Construction: Joint pipes to be placed in short tunnels prior to being placed into position.
   a. Place the pipe into position in a manner which keeps joints tight.

3.3 FIELD QUALITY CONTROL

A. Testing: Test pipelines in accordance with Section 01 45 50.

1. Test valves in place, as far as practicable, and correct any defects in valves or connections.

B. Inspection: Clean, inspect, and examine each piece of pipe and each fitting and special for defects before it is installed.

1. Cut away any lumps or projections on the face of the spigot end or the shoulder.

2. Do not use any cracked, broken, or defective pieces in the work.

3. If any defective piece should be discovered after having been installed, remove and replace this piece with a sound piece in a satisfactory manner at no increase in Contract Amount.

3.4 CLEANING

A. General: Thoroughly clean all pipe before it is laid and keep it clean until it is accepted in the completed work.

B. Removal of Materials: Exercise special care to avoid leaving bits of wood, dirt, and other foreign particles in the pipe. If any particles are discovered before the final acceptance of the work, remove and clean the pipe.

3.5 DISINFECTION

A. General: Disinfect all pipelines that are to carry potable water in accordance with Section 33 13 00.

3.6 SCHEDULE

A. Definitions: Abbreviations used in the schedule are:

1. Pipe Materials:

a.	Al	Aluminum
b.	Br	Brass
c.	C	Concrete
d.	CI	Cast-iron
e.	CISP	Cast-iron soil pipe
f.	Cl	Clay
g.	CPVC	Chlorinated Polyvinyl Chloride
h.	CU	Copper
i.	DI	Ductile Iron
j.	PCCP	Prestressed Concrete Cylinder Pipe
k.	PE	Polyethylene
l.	PVC	Polyvinyl Chloride
m.	RCP	Reinforced Concrete Pipe
n.	RCPP	Reinforced Concrete Pressure Pipe
o.	SS	Stainless Steel
p.	St	Steel

2. Joints:

a.	B&S	Bell and Spigot
b.	F	Flanged
c.	G	Grooved End
d.	H	Harnessed
e.	HSC	Hub and Spigot - Compression Gasket
f.	HSL	Hub and Spigot - Lead and Oakum
g.	MJ	Mechanical Joint
h.	PO	Push-on Joint
i.	RRG	Restrained Retainer Gland
j.	RS	Rubber and Steel
k.	Sd	Soldered
l.	Sl	Sleeve Type Coupling
m.	SW	Solvent Welded
n.	W	Welded

3. Coatings and Linings:

a.	BC	Bituminous - Cold Application
b.	CE	Concrete Encased
c.	CL	Cement-Mortar Lined
d.	E	Epoxy
e.	G	Galvanized
f.	GL	Glass Lined
g.	I	Insulated
h.	KL	Polyvinylidene Fluoride (PVDF or KYNAR®)
i.	P	Painted
j.	PEW	Polyethylene Wrapped
k.	PPL	Polypropylene Lined
l.	RC	Rubber Coated
m.	RL	Rubber Lined
n.	SL	Polyvinylidene Chloride (PVDC or SARAN ®)
o.	TC	Tape Coated
p.	W	Wrapped

B. Schedule: Provide products as listed in the following schedule:

BURIED PIPING SCHEDULE

Service	Size (Inches)	Pipe Material	Protective Coatings Int.	Protective Coatings Ext.	Joints	Test Pressure (psig)(1)	Pipe Class or Thickness	Remarks
Plant Water to Hydrant	8	DI	CL	PEW	PO,RRG	125	53	
City Water to Drinking Fountain	3 & 1.5	CU	-	-	Sd	150		
Drainage	6	DI	CL	-	B&S	-	56	
Irrigation Piping (See Irrigation Drawings. Pressure test to 100 psi)								
Drainage Retention Facility (See Civil Drawings)								

Notes:

(1) Measure the test pressures shown in the schedule at the centerline of the pipeline's low point.

Adjust test pressures measured at other locations accordingly.

END OF SECTION 33 05 50

SECTION 33 05 55
BURIED DUCTILE-IRON PIPE AND FITTINGS

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. Related Work specified in other sections includes, but is not limited to, the following:

1.	Specification 01 45 50	-	Leakage Test
2.	Specification 33 05 50	-	Laying and Jointing Buried Pipelines
3.	Specification 33 13 00	-	Disinfection

1.2 SECTION INCLUDES

A. Requirements for providing buried ductile-iron pipe, fittings and appurtenances, except soil pipe.

1. Provide ductile-iron pipe and fittings complete with all necessary jointing facilities and materials, specials, adapters and other appurtenances required for installation in and completion of the pipelines to be constructed.

2. Provide flanged, plain end or rubber gaskets (push-on or mechanical joint) of the types, sizes and classes shown or specified.

1.3 REFERENCES

A.	AWWA C104/A21.4	-	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
B.	AWWA C105/A21.5	-	Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
C.	AWWA C110/A21.10	-	Ductile-Iron and Gray-Iron Fittings 3 In. Through 48 In., for Water and Other Liquids
D.	AWWA C111/A21.11	-	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
E.	AWWA C115/A21.15	-	Flanged Ductile-Iron Pipe With Threaded Flanges

F.	AWWA C151/A21.51	-	Ductile-Iron Pipe, Centrifugally Cast, for Water and Other Liquids
G.	AWWA C153/A21.53	-	Ductile-Iron Compact Fittings, 3 In. Through 12 In., for Water and Other Liquids
H.	ASME B16.1	-	Cast Iron Pipe Flanges and Flanged Fittings
I.	AWWAC606	-	Grooved and Shouldered Type Joints
J.	ASTM A 307	-	Carbon Steel Externally Threaded Standard Fasteners

1.4 SYSTEM DESCRIPTION

A. Design Standards: Provide ductile-iron pipe meeting the requirements of AWWA C151/A21.51.

1. Provide pipe of the various sizes and classes as specified in the schedule or shown, except provide minimum Thickness Class 53 for pipe with threaded flanges. Locate restrained joints and various beddings as shown.

2. Construct concrete encasements where shown.

1.5 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Submit the following shop drawings:

1. Pipe joints, fittings, sleeves and cleanouts. Where special designs or fittings are required, show the Work in large detail and completely describe and dimension all items.

2. Fully dimensioned drawings of piping layouts, including fittings, couplings, sleeves, cleanouts, valves, supports and anchors. Label pipe size, materials, type, and class on drawings and include the limits of each reach of restrained joints. Provide cross sections showing elevations of cleanouts, pipes, fittings, sleeves, and valves.

3. Alignment survey and laying schedule as specified in the DDC General Conditions. Cross reference the laying schedule to identification marks on pipeline pieces.

4. Catalog data for pipe, joints, fittings, sleeves, harnessing and cleanouts.

C. Quality Control: Submit certificate of compliance for pipe, fittings, gaskets, lining, polyethylene encasement, coatings, specials, sleeves and cleanouts in accordance with this Section.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all pipe, fittings and appurtenances as specified in DDC General Conditions and Section 33 05 50.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Manufacturers of equivalent products may be submitted as an "or approved equal".

1. Ductile-iron pipe and fittings:
   a. American Cast Iron Pipe Company
   b. McWane Incorporated
   c. United States Pipe and Foundry

2. Ductile-iron retainer glands:
   a. Nappco, Inc. Series 1246
   b. Ebba Iron, Inc. Series 1100
   c. Sigma Corporation

3. Restrained push-on joints:
   a. U.S. Pipe and Foundry TR Flex
   b. McWane Inc. Super-Lock
   c. American Cast Iron Pipe Company Lok-Ring or Flex-Ring

4. Gaskets:
   a. John Crane, Inc.
   b. Garlock Packing Company
   c. U.S. Rubber Company
   d. American Cast Iron Pipe Company
   e. United States Pipe and Foundry
   f. McWane Inc.

5. Coatings and Linings:
   a. Kop-Coat
   b. Tnemec
   c. American Cast Iron Pipe Company
   d. United States Pipe and Foundry

2.2 MATERIALS

A. Fittings: Provide all fittings meeting the requirements of AWWA C110/A21.10, unless shown or specified otherwise. Fittings 14 inches and larger require a pressure rating of 150 psi, or as specified, whichever is greater.

   1. Flanged: Where long radius flanged fittings and other flanged fittings not covered in AWWA C110/A21.10 are shown or specified, provide items meeting the requirements of AWWA C110/A21.10 and having laying lengths conforming to ASME B16.1 for 125-pound American Standard fittings.

   2. Compact Mechanical Joint and Rubber Gasket Joint: Where compact mechanical joint or rubber gasket joint fittings are shown or specified, provide items meeting the requirements of AWWA C153/A21.53.

B. Flanged Joints:

   1. Threaded Flanges: Provide threaded, ductile-iron long hub flanges meeting the requirements of AWWA C115/A21.15.

a. Screw flanges on the threaded end of the pipe in the shop.

b. Reface the face of the flange and the end of the pipe together.

c. Design flanges to prevent corrosion of the threads from the outside and to prevent leakage through the pipe threads.

2. Facing and Drilling: Provide flanges plain faced and drilled to the requirements of AWWA C115/A21.15, unless special drilling is called for or required. Face flange accurately at right angles to the pipe axis. Drill flanges smooth and true, and cover machined faces with zinc dust and tallow or equivalent material.

3. Taps: Tap flanges where tap or stud bolts are required.

4. Fasteners: Provide bolts, stud bolts, and nuts meeting the requirements of ASTM A 307, Grade B.

5. Gaskets: Provide full-face gaskets for flanged joints on 12-inch diameter and smaller pipe and gaskets of the ring type for flanged joints on larger pipe. Provide flange gaskets meeting the requirements of AWWA C115/A21.15, except make gaskets for gas lines with neoprene and aramid.

C. Rubber Gasket Joints: Provide mechanical joints and push-on type joints meeting the requirements of AWWA C111/A21.11.

D. Harnessing: For ductile-iron pipe and fittings with mechanical joints that require harnessing, provide ductile-iron mechanical joint retainer glands.

1. Coatings: Coat the assembly with two heavy coats of asphalt varnish conforming to AWWA C151/A21.51 after installation.

2. Joint Assemblies: Design the joint assemblies to resist pullout of the joints at the test pressures specified.

E. Sleeves: Provide mechanical joint solid sleeves meeting the requirements of AWWA C110/A21.10 where shown, specified or required for connection to existing facilities.

F. Cleanouts

1. Provide cleanouts where shown or specified.

2. Size: Provide not less than 6 inch diameter cleanout openings for pipe 8 inches in diameter or larger. Provide cleanout openings for pipe 6 inches in diameter or smaller of the same diameter as the pipe.

3. Cleanout Covers: Provide cleanout covers which are blind flanges meeting the requirements of AWWA C110/A21.10, except where conformation is required with the inside curvature of the pipeline, in which case the covers are flanged plugs of proper shape with American Standard flange drilling.

   a. Fasten covers by means of steel studs and bronze nuts. Drill and tapcovers for a 1-1/2-inch diameter pipe connection.

4. Plugs: Equip the flange of conformed plugs with a dowel or other suitable means for proper setting.

G. Linings and Coatings

1. Cement Lining: Provide ductile-iron pipe and fittings having a cement-mortar lining not less than standard thickness meeting the requirements of AWWA C104/A21.4, unless shown or specified otherwise.

2. Asphaltic Coating: Shop coat pipe which is to be buried with the standard asphaltic outside coating specified in AWWA C151/A21.51.

3. Encased Pipe: Do not coat or paint the outside of fittings and pipe which are to be encased in concrete.

4. Labels: Paint the size, class designation, manufacture date, and control number cross referenced to the laying schedule conspicuously in white on the outside of each pipe, fitting, and special casting after the shop coat has hardened.

5. Flange Joints: Immediately after facing and drilling, coat the back of the flanges and bolt holes with asphaltic coating meeting the requirements of AWWA C151/A21.51, Section 51-8.1.

PART III - EXECUTION

3.1 INSTALLATION

A. Install all buried ductile iron pipe and fittings in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions and Section 33 05 50.

3.2 LEAKAGE TESTING

A. Cleaning: Flush clean and test all pipes after installation.

B. Testing: Test pipes for leaks and repair or tighten as required.

C. Procedures: Conduct tests in accordance with Section 01 45 50.

3.3 DISINFECTION

A. General: Disinfect all pipelines that are to carry potable water before they are placed into service as specified in Section 33 13 00.

3.4 SCHEDULES

A. Refer to the Schedules contained in Section 33 05 50 Laying and Jointing Buried Pipelines for information on the piping that is to be constructed using the pipe materials and methods specified herein.

END OF SECTION 33 05 55

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SECTION 33 12 19
HYDRANTS

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.

1.2 SECTION INCLUDES

A. Furnishing and installing hydrants as indicated.

1.3 REFERENCES

A. NFPA 1963 - Fire Hose Connection

B. AWWA C502 - Dry Barrel Fire Hydrants

1.4 GENERAL REQUIREMENTS

A. All hydrants shall turn clockwise to close, unless otherwise specified.

B. All hydrants shall have permanent markings for direction to open.

C. Hydrants shall be provided with restrained mechanical joints.

1.5 SUBMITTALS

A. Submit the following Working Drawings and other data for approval in accordance with the DDC General Conditions.

1. Product data sheets for make and model.

2. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.

3. Shop test results and inspection data.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Manufacturer shall have a minimum of 3 years of experience in the production of substantially similar hydrants, and shall show evidence of satisfactory service in similar installations.

1.7 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be delivered to the site to ensure uninterrupted progress of the Work.

B. Hydrants and appurtenances shall be handled carefully. Hydrants and hose houses which are dropped, dented, cracked or otherwise damaged will not be acceptable.

PART II - PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers are listed below. Each type of hydrant shall be the product of one manufacturer. Other manufacturers of equivalent products may be submitted as an "or approved equal".

1. American Flow Control
2. M&H Valve Company
3. Kennedy Valve Company

2.2 MATERIALS

A. General:

1. Compression type with breakaway flange and stem.
2. Opening shall be against flow to prevent leakage in the event of a traffic accident.
3. Barrel shall automatically drain and remain dry after use.
4. Top shall be isolated from the waterway by packing or O-rings.
5. Rising stem to indicate hydrant in the open or closed position.

B. Materials of Construction:

1. Body and Bonnet: Cast Iron, with fusion bonded epoxy in accordance with AWWA C550.

2. Main Valve: Bronze with bronze seats and rubber facing.

3. Drain Valves: Bronze.

4. Drain Valve Rod: Steel.

5. Main Valve Stem: Solid Steel.

6. Working Pressure: 150 psig.

7. Shop Test Pressure: 300 psig.

C. Breakaway Features:

1. The groundline flange bolts shall be breakable.

2. A breakaway coupling shall be provided in the valve stem.

D. Miscellaneous Features:

1. A drain valve shall be actuated when the main valve is in the closed poition to maintain the barrel in a dry condition.

2. Hydrant shall have two 2-1/2 inch fire hose connections and one 4-1/2 inch pumper nozzle, each with standard N.Y.F.D. threads and dust-cap with stainless steel chain. Contractor shall verify threads are compatible with NYC Fire Department standards.

3. Main valve shall be 5-1/4 inch.

4. End connection shall be 6-inch mechanical joint.

5. Hydrants shall be provided with extensions as required for the depth shown on the Drawings

PART III - EXECUTION

3.1 INSTALLATION

A. Install all fire hydrants in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions.

B. All hydrants shall be set on a 1/3 cubic yard of 3/8" crushed gravel wrapped in engineering fabric.

C. All hydrants shall have a minimum 48-inch bury.

D. Each hydrant shall be furnished with a shut-off gate valve and valve box.

3.2 PAINTING

A. Paint all fire hydrants according to the requirements of AWWA C502.

3.3 FIELD TESTS AND ADJUSTMENTS

A. All parts and components shall be adjusted as required to provide correct operation.

B. A functional field test of each hydrant shall be conducted in the presence of the COMMISSIONER to demonstrate that each part and all components function together correctly.

C. Each hydrant shall be furnished with a shutoff gate valve and valve box.

D. Hydrostatic tests shall be combined with the testing of the entire pipeline to which each hydrant is connected.

END OF SECTION 33 12 19

SECTION 33 13 00
DISINFECTION

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.

1.2 SECTION INCLUDES

A. Disinfection of all pipelines, tanks, structures, conduits and equipment which are to store, handle or carry potable water. Furnish all labor, water, chemicals and equipment, including taps, corporation stops, temporary pumps and other items necessary to perform the Work, except as otherwise specified.

1.3 OPERATION OF EXISTING FACILITIES

A. Conduct all work in a manner to minimize as much as possible any interference with the day-to-day operations of existing facilities or other contractors working on the site.

1.4 REFERENCES

A. Codes and standards referred to in this Section are:

1. AWWA C651 - Disinfecting Water Mains

2. AWWA C652 - Disinfection of Water-Storage Facilities

1.5 QUALITY ASSURANCE

A. Disinfection Standards: Disinfect in accordance with AWWA C651 for water mains and AWWA C652 for water storage facilities and equipment.

B. Local Requirements: Conform disinfection procedures to local health department requirements for new water mains and structures.

C. Chlorinated Water Disposal: Dispose of old highly chlorinated water in accordance with applicable regulations.

PART II - PRODUCTS

Not Used

PART III - EXECUTION

3.1 APPLICATION

A. Disinfection Procedures for Piping: Flush pipelines with clean water before disinfecting. Disinfect by the continuous feed method, as specified in AWWA C651, using sodium hypochlorite solution. Then add chlorinated water containing not less than 50 mg/l free available chlorine followed by clean water at one end of the section being disinfected and discharged at the far end.

1. Add the chlorinated water until the water coming from each downstream blowoff has a residual of not less than 25 mg/l of chlorine.

2. Close the pipelines and allow the solution to remain in the lines for at least 24 hours. Recheck the chlorine residual in the pipeline. If the free chlorine residual is less than 10 mg/l after 24 hours, disinfect the pipelines again with more concentrated chlorinated water.

3. After meeting the previous requirements in this subsection and after a 24-hour holding period, thoroughly flush out the pipelines and equipment and fill with clean water. Do not permit flushing water to discharge into existing water mains. The water for this filling will be furnished by the Contractor.

3.2 VERIFICATION OF DISINFECTION

A. Final Samples: Bacteriological samples will be taken and tested by the Contractor on two successive days. If the samples are not satisfactory, repeat the entire disinfection procedure.

1. Assume the expense of taking and testing additional samples until satisfactory samples are obtained.

2. Assume the expense of all water for subsequent fillings of the pipelines, tanks and equipment.

END OF SECTION 33 13 00

SECTION 40 05 18
MISCELLANEOUS PIPE AND FITTINGS

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. Related Work specified in other Sections includes, but is not limited to, the following:

1.	Section 01 45 50	-	Leakage Tests
2.	Section 22 10 00	-	Plumbing Piping and Valves
3.	Section 33 05 50	-	Laying and Jointing Buried Pipelines
4.	Section 33 05 55	-	Buried Ductile Iron Pipe and Fittings
5.	Section 33 13 00	-	Disinfection

1.2 SECTION INCLUDES

A. Requirements for providing miscellaneous pipe and fittings as indicated. Miscellaneous pipe and fittings include all aluminum, copper, brass, plastic, cast-iron soil and lined steel pipe and fittings.

1.3 REFERENCES

A. Codes and standards referred to in this Section are:

1.	ASTM A 74	-	Specification for Cast Iron Soil Pipe and Fittings
2.	ASTM B 26/B26M	-	Aluminum Alloy Sand Castings
3.	ASTM B 32	-	Specification for Solder Metal
4.	ASTM B 42	-	Specification for Seamless Copper Pipe, Standard Sizes
5.	ASTM B 43	-	Specification for Seamless Red Brass Pipe, Standard Sizes
6.	ASTM B 108	-	Specification for Aluminum Alloy Permanent Mold Castings

7.	ASTM B 241	-	Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube
8.	ASTM C 564	-	Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
9.	ASTM D 1784	-	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
10.	ASTM D 1785	-	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
11.	ASTM D 2464	-	Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
12.	ASTM D 2564	-	Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
13.	ASTM D 2855	-	Recommended Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
14.	ASTM F 491	-	Specification for Poly (Vinylidene Fluoride) (PVDF) Plastic-Lined Ferrous Metal Pipe and Fittings
15.	ASTM F 492	-	Specification for Propylene and Polypropylene (PP) Plastic-Lined Ferrous Metal Pipe and Fittings
16.	ASTM F 599	-	Specification for Poly (Vinylidene Chloride) (PVDC) Plastic-Lined Ferrous Metal Pipe and Fittings
17.	ASME B1.20.1	-	Screw Threads - Pipe Threads, General Purpose (Inch)
18.	ASME B16.15	-	Cast Bronze Threaded Fittings, Classes 125 and 250 (Includes Revisions Service)
19.	ASME B16.18	-	Cast Copper Alloy Solder Joint Pressure Fittings (Includes Revision Service)
20.	ASME B16.22	-	Wrought Copper and Copper Alloy Solder-Joint Pressure Fitting (Includes Revision Service)
21.	ASME	-	Boiler and Pressure Vessel Codes, Section IX – Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.

22.	AWWA C151/A21.51		Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
23.	CISPI 301	-	Hubless Cast Iron Sanitary System
24.	CISPI 310	-	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications
25.	AWS A5.8	-	Brazing Filler Metal

1.4 ENGINEERING REQUIREMENTS

A. Pipe and fittings shall conform to the latest NYC Building Code in respect to plumbing and other applications covered by these laws.

B. Use only NSF-61 approved materials in potable water lines.

1.5 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Shop Drawings: Submit the following Shop Drawings.

1. Submit complete detailed shop drawings in conformance with the specified requirements.

2. Include drawings that show the piping layouts and schedules of all pipe, fittings, valves, expansion joints, flexible couplings, hangers, supports and other appurtenances.

3. When any work is of special design show in large detail and completely describe and dimension.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all products and materials as specified in the DDC General Conditions.

B. Transportation and Delivery: Take every precaution to prevent injury to the pipe during transportation and delivery to the site.

C. Loading and Unloading: Take extreme care in loading and unloading the pipe and fittings.

1. Work slowly with skids or suitable power equipment, and keep pipe under perfect control at all times.

2. Under no condition is the pipe to be dropped, bumped, dragged, pushed, or moved in any way that will cause damage to the pipe or coating.

D. Sling: When handling the pipe with a crane, use a suitable sling around the pipe.

1. Under no condition pass the sling through the pipe.

2. Use a nylon canvas type sling or other material designed to prevent damage to the pipe and coating.

3. When handling reinforced concrete pipe or uncoated steel or ductile iron pipe, steel cables, chain or like slings are acceptable.

E. Damaged Piping: If in the process of transportation, handling, or laying, any pipe or fitting is damaged, replace or repair such pipe or pipes.

F. Blocking and Stakes: Provide suitable blocking and stakes installed to prevent pipe from rolling.

1. Obtain approval for the type of blocking and stakes, and the method of installation.

G. Storage for Gaskets: Store gaskets for pipe joints in a cool place and protect gaskets from light, sunlight, heat, oil, or grease until installed.

1. Do not use any gaskets showing signs of checking, weathering or other deterioration.

2. Do not use gasket material stored in excess of six months without approval.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted as an "or approved equal".

1. Pipe and Fittings:
   a. Aluminum Pipe and Fittings
      (a) ALCOA, Pittsburgh, PA
      (b) ALCAN Aluminum Corp., Cleveland, OH
      (c) Century Aluminum Company, Chicago , IL

   b. Brass Pipe and Fittings
      (a) Metalloy Industries, Inc., Ft. Lauderdale, FL
      (b) Nibco, Elkhart, IN
      (c) United Brass Manufacturers INC, Romulus, MI

c. Cast-Iron Soil Pipe and Fittings
   (a) U.S. Pipe and Foundry Co., Birmingham, AL
   (b) Tyler Pipe Industries, Tyler, TX
   (c) Charlotte Pipe and Foundry, Charlotte, NC

d. Copper pipe and Fittings
   (a) Mueller Industries, Inc., Wichita, KS
   (b) Nibco, Elkhart, IN
   (c) Cerro Flow Products, LLC, St. Louis, MO

e. PVC and CPVC Pipe and Fittings
   (a) United States Plastic Corp., Lima, Ohio
   (b) Harvel Plastics Inc., Easton, Pennsylvania
   (c) Lewis Pipe Company, Ardmore, AL

f. Wall Sleeve Annular Seals
   (a) Thunderline Corp. (Link-Seal), Belleville, MI
   (b) The Metraflex Corporation, Metraseal, Chicago, IL
   (c) Flexicraft Industries (the Pipe Seal), Chicago, IL

2. Dielectric Insulating Fittings:
   a. Walter Vallett Co., Detroit, MI
   b. EPCO, Inc., Cleveland, OH
   c. Watts Industries

2.2 MATERIALS

A. Aluminum Pipe and Fittings

1. Pipe: Provide aluminum pipe of Alloy 6061 and T6 temper conforming to ASTM B 241.

2. Welding and Threaded Fittings: Provide aluminum forged welding fittings or cast threaded fittings conforming to ASTM B 26/B26M or B 108.

3. Flanged and Coupling Connections: Provide joints that are made with aluminum mechanical couplings in combination with grooved, flared or plain end pipe or that are flanged.

   a. When grooved couplings are used, roll the grooves into the pipe in conformance with the coupling manufacturer's specifications.

   b. Do not use cut grooves.

4. Lubricating Compound: Carefully assemble fittings and couplings with an approved lubricating compound to prevent seizing of the connection and overstressing of the pipe.

   a. Provide a lubrication compound which both lubricates and seals, for pipelines subject to internal pressure.

5. Supports: Use aluminum, hot-dipped galvanized steel or other approved type.

B. Brass Pipe and Fittings

1. Pipe: Provide red brass pipe that meets the requirements of ASTM B 43.

   a. Provide pipe sizes, wall thicknesses and dimensions that meet the ASTM B 43 Table 2 requirements for regular pipe.

2. Fittings: Provide brass pipe fittings that meet the ASME B16.15 requirements.

   a. Provide fittings rated for steam working pressures up to 125 psig.

   b. Provide unions made entirely of brass or bronze.

   c. Provide screwed type joints with clean cut, tapered and smooth threads that meet ASME B1.20.1 requirements.

3. Finish: Provide piping with a rough finish, unless otherwise specified.

C. Cast-Iron Soil Pipe and Fittings

1. Pipe and Fittings: Provide service weight, hub and spigot, cast-iron soil pipe and fittings meeting the requirements of ASTM A 74 or hubless cast iron soil pipe and fittings meeting the requirements of CISPI 301. Do not use hubless pipe and joints for buried pipe.

2. Protective Coatings: Provide interior protective coatings (linings) and exterior protective coatings for pipe and fittings in the finished work as follows and as indicated in the piping schedules:

   a. For pipe and fittings not exposed in the finished work, provide an interior bituminous lining and an exterior bituminous coating that meet AWWA C151/A21.51 requirements.

   b. For pipe and fittings exposed in the finished work, provide an interior bituminous lining that meets AWWA C151/A21.51 requirements.
      (a) If the pipe schedules indicate that the pipe exterior is to be painted, paint in accordance with the Contract Drawings.

(b) If the pipe schedules indicate that the pipe exterior is to have a bituminous coating, coat the pipe in accordance with the requirements in AWWA C151/A21.51.

3. Joints: Provide lead and oakum joints or neoprene gasket, compression type joints in accordance with ASTM C 564 for hub and spigot pipe. Consult the piping schedules. Provide hubless couplings for hubless pipe. Compose hubless couplings of a stainless steel shield, clamp assembly and an elastomeric sealing sleeve conforming to CISPI 310.

4. Cleanouts: Provide cleanouts where shown or specified, and meeting the requirements of Section 22 10 00, unless otherwise specified.

D. Polyvinyl Chloride (PVC) and Chlorinated Polyvinyl Chloride (CPVC) Pipe and Fittings

1. Pipe and Fittings: Provide PVC pipe and fittings that are Schedule 80 and meet the requirements of ASTM D 1784 Class 12454 B and ASTM D 1785 unless otherwise shown or specified. Provide CPVC pipe and fittings that are Schedule 80 and meet the requirements of ASTM D 1784 Class 23447-B and ASTM D 1785, unless otherwise shown.

2. Joints: Provide ASTM D 2855 solvent welded joints utilizing ASTM D 2564 solvent cement or ASTM D 2464 threaded joints, as indicated in the piping schedules.

E. Copper Pipe and Fittings:

1. Small Copper Piping: For copper pipe 3 inches in diameter and smaller, provide Type K seamless, round, hard drawn copper tubing that meets ASTM B88 requirements. Provide tube sizes, dimensions and wall thickness conforming to ASTM B88, Table 1 for Type K tubing, unless otherwise specified. Provide nominal lengths of hard copper tubing in straight lengths of approximately 20 feet, unless otherwise specified.

a. Fittings: For copper tubing, use solder joint or flared end type fittings, as specified. No bending of hard copper tubing will be permitted, unless otherwise specified; make all bends and connections with suitable fittings.

(a) Provide flared tube fittings meeting the requirements of the SAE Hydraulic Tube Fittings standard. After flaring, anneal the joints before assembly. Flared fittings shall be of brass half-hard bar stock, ASTM B 16 (SAE 72) or of brass forgings, ASTM B 124, Alloy Number 2 (SAE 88). Assemble couplings and fittings to prevent overstressing the tubing. Where required, use anti-seize lubricating compound to prevent galling and to facilitate assembly.

(b) Solder Joint Fittings: Provide ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and copper alloy fittings. Braze solder joint fittings and tubing in conformity with the specifications of Section 3 of the CABRA Copper Tube Handbook. Brazing alloy shall be copper-phosphorus alloy, Class BCuP-5, as specified by American Welding Society Spec. AWS A5.8.

b. Joints: Provide threaded or ASTM B32 lead-free soldered joints.

2. Large Copper Piping: For copper pipe larger than 3 inches in diameter, provide regular seamless copper pipe that meets the ASTM B42 requirements.

a. Fittings: Provide solder type fittings of the same material as the pipe.

b. Joints: Use threaded or brazed joints.

3. Potable Water Piping: Use ASTM B32 alloy Grade 95TA (95 percent tin and 5 percent antimony) solder for piping carrying potable water.

4. Unacceptable Uses: Do not use copper pipe with soldered joints for transporting fuel oil or other flammable or toxic liquids inside buildings.

F. Lined Steel Piping

1. Polyvinylidene Chloride (PVDC) Lined: Provide PVDC lined steel pipe and fittings meeting the requirements of ASTM F 599, except provide PVDC liner that has a minimum elongation at yield of 5 percent.

2. Polypropylene Lined: Provide Type I polypropylene lined steel pipe and fittings meeting the requirements of ASTM F 492.

3. Polyvinylidene Fluoride (PVDF) Lined: Provide PVDF lined steel pipe and fittings meeting the requirements of ASTM F 491.

G. Wall Pipes and Sleeves for Miscellaneous Pipe and Fittings

1. Wall Pipes:
   a. Where wall pipes are shown or specified, provide ductile iron wall pipes that meet the requirements of AWWA C110/A21.10 with end connections that are 1) of the types shown and 2) flush with the surfaces of the walls or floors. Unless otherwise shown or specified, provide wall pipes with intermediate collars located at the centers of the walls or floors.

2. Sleeves:
   a. Where pipes pass through exterior walls or floors or wetted interior walls or floors of structures and where wall pipes are not to be provided, provide

ductile-iron sleeves meeting the requirements of AWWA C110/A21.10 with ends that are flush with the wall or floor surfaces and with intermediate collars located at the centers of the walls or floors.

b. Where pipes pass through non-wetted interior walls or floors and where wall pipes are not to be provided, provide ductile-iron sleeves meeting the requirements of AWWA C110/A21.10; steel pipe sleeves meeting the requirements of Section 40 05 18 or as shown or specified otherwise. Provide sleeves with ends flush with the wall or floor surfaces. Where shown or specified, provide intermediate collars located at the centers of the walls or floors.

c. Provide sleeves having large enough diameters to accommodate the passage of pipe joints, if required.

d. HDPE Sleeves: Where shown or specified, provide molded HDPE sleeves as manufactured by the Thunderline Corporation; JCM Industries, Inc.; J.M.Eagle; or approved equal, with integrally formed intermediate collars or waterstops.

e. Where shown or specified, provide modular, mechanical sleeve seals, meeting the requirements of this Section, in the annular spaces between pipes and sleeves. In all other locations, caulk the annular spaces between pipes and sleeves with caulk meeting the requirements in Section 07 92 00.

H. Modular, Mechanical Sleeve Seals: Provide modular, mechanical type seals consisting of interlocking, synthetic-rubber links shaped to continuously fill the annular space between the pipe and the sleeve. Provide an elastomeric sealing element that is of the size, quantity, type and material that the manufacturer recommends for the intended service and that will provide an effective hydraulic seal. Provide stainless steel bolts and nuts.

I. Supports and Anchors: Provide all pipelines with supporting and anchoring devices in accordance with the DDC General Conditions.

J. Drip Pans: Provide drip pans constructed of 16-gauge Type 304 stainless steel.

PART III - EXECUTION

3.1 INSTALLATION

A. General: Install all miscellaneous pipe and fittings in accordance with the specifications contained herein and in Sections 33 05 50 and 40 05 20 and in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions.

B. Connections Between Dissimilar Metals: Where connections are to be made between pipelines or equipment of corrosion causing dissimilar metals make the connections using dielectric insulating couplings, unions or other approved dielectric insulating devices.

C. Couplings: Only use couplings to join standard lengths of pipe and as required to complete a straight run of pipe. Do not use couplings to join random lengths of pipe and cuttings from standard lengths.

D. Reducing Fittings: Use reducing fittings for all changes in pipe size. Do not use bushings.

E. Pipe Flexibility: Make ample provisions for flexibility in all pipelines in accordance with Section 33 05 50.

F. Drip Pans: Provide drip pans under all metallic pipelines installed over electrical equipment and motors and properly connect to the drainage system with 3/4-inch red brass pipe. Make leaktight connection between the drip pan and the drain pipe. Pitch pans uniformly toward the drain pipe not less than 1/8-inch per lineal foot.

3.2 CLEANING AND PAINTING

A. Cleaning: Flush all process and potable water pipelines with clean water.

B. Leakage: Test pipes at the pressures specified in the piping schedules located in Section 33 05 50 and Section 40 05 18.

C. Paint in accordance with the Contract Drawings, unless otherwise specified.

3.3 DISINFECTION

A. Disinfect all potable water pipelines in accordance with Section 33 13 00.

3.4 SCHEDULES

A. Refer to the schedules contained in Section 33 05 50 Laying and Jointing Buried Pipelines and Section 40 05 18 Miscellaneous Pipe and Fittings for information on the piping that is to be constructed using the pipe materials and methods specified herein.

END OF SECTION 40 05 18

SECTION 40 05 20
VALVES

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.

B. Related Work specified in other sections includes, but is not limited to, the following:

1.	Specification 01 45 50	-	Leakage Tests
2.	Specification 22 10 00	-	Plumbing Piping and Valves
3.	Specification 26 05 00	-	General Electrical Requirements
4.	Specification 26 05 19	-	Low-Voltage Electrical Power Conductors and Cables
5.	Specification 33 05 13	-	Sanitary and Strom Sewer Structures
6.	Specification 40 05 18	-	Miscellaneous Pipe and Fittings

1.2 SECTION INCLUDES

A. Requirements for furnishing and installing all valves and operators, except special regulating valves, telescopic valves, flap valves and valves specified in Section 22 10 00 - Plumbing Piping and Valves.

1. Where valve operators are installed in NEC Class I, Group D, Division 1 or 2 hazardous locations (as specified), provide operator-related electrical equipment and appurtenances that are UL, Inc. approved for use in such areas.

2. Provide valve operators complete, including a suitable enclosure, with all appurtenances necessary for the operator to perform its intended function. Such appurtenances include, but are not limited to, anchor bolts and other mounting hardware, control switches, limit switches, pressure switches, torque switches, gauges, control valves, electrical supply connections, internal electric wiring and controls, terminal blocks, air supply piping, solenoid valves, miscellaneous valves, regulating controls, push button controls, miscellaneous controls, extension stems, local and remote indicators, operating nuts, purge water service with all associated

piping, indicating lights, floor boxes, direct burial valve boxes and other such items.

3. For each valve, provide the type of operator specified for the valve in the Valve Schedule.

1.3 REFERENCES

A. Codes and standards referred to in this Section are:

1.	ASME B1.20.1	-	Pipe Threads, General Purpose
2.	ASME B1.20.7	-	Hose Coupling Screw Treads
3.	ASME B16.1	-	Cast Iron Pipe Flanges and Flanged Fittings
4.	ASTM A 27/A27M	-	Specification for Steel Castings, Carbon, for General Application
5.	ASTM A 29/A29M	-	Specification for Steel Bars, Carbon and Alloy, Hot Wrought and Cold-Finished, General Requirements
6.	ASTM A 48	-	Specifications for Gray Cast Iron Castings
7.	ASTM A 126	-	Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
8.	ASTM A 197	-	Specification for Cupola Malleable Iron
9.	ASTM A 276	-	Specification for Stainless and Heat-Resisting Steel Bars and Shapes
10.	ASTM A 278	-	Specification for Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650 F
11.	ASTM A 395	-	Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
12.	ASTM A 436	-	Specification for Austenitic Gray Iron Castings
13.	ASTM A 479/A479M	-	Specification for Stainless and Heat Resisting Steel Wire Bars, and Shapes for Use in Boilers and Other Pressure Vessels
14.	ASTM A 536	-	Specification for Ductile Iron Castings

15.	ASTM A 564/A564M -	Hot Rolled and Cold Finished Age Hardening Stainless and Heat Resisting Steel Bars and Shapes
16.	ASTM A 572/A572M -	Specification for High Strength Low Alloy Columbium Vanadium Steels of Structural Quality
17.	ASTM A 743/A743M -	Specifications for Castings, Iron-Chromium, Iron-Chromium - Nickel, and Nickel-Base Corrosion-Resistant for General Application
18.	ASTM A 744/A744M -	Specification for Castings, Iron-Chromium-Nickel, Corrosion-Resistant, for Severe Service
19.	ASTM B 30 -	Specification for Copper Base Alloys in Ingot Form
20.	ASTM B 62 -	Specification for Composition Bronze or Ounce Metal Castings
21.	ASTM B 148 -	Specification for Aluminum-Bronze Castings
22.	ASTM B 584 -	Specification for Copper Alloy Sand Castings for General Applications
23.	AWWA C500 -	Metal Seated Gate Valves for Water and Sewerage Systems
24.	AWWA C502 -	Dry-Barrel Fire Hydrants
25.	AWWA C504 -	Rubber-Seated Butterfly Valves
26.	AWWA C508 -	Swing Check Valves for Waterworks Service, 2 inch through 24 inch NPS
27.	AWWA C509 -	Resilient-Seated Gate Valves for Water Supply Service
28.	AWWA C540 -	Power-Actuating Devices for Valves and Sluice Gates
29.	MSS SP-70 -	Cast Iron Gate Valves, Flanged and Threaded Ends
30.	MSS SP-71 -	Cast Iron Swing Check Valves, Flanged and Threaded Ends

31.	MSS SP-80	-	Bronze, Globe, Angle and Check Valves
32.	NACM	-	Welded and Weldless Chain Specifications
33.	SAE J356	-	Welded Flash Controlled Low-Carbon Steel Tubing Normalized for Bending, Double Flaring, and Beading
34.	SAE J524	-	Seamless Low-Carbon Steel Tubing Annealed for Bending and Flaring
35.	SAE J525	-	Welded and Cold-Drawn Low-Carbon Steel Tubing Annealed for Bending and Flaring

1.4 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in the DDC General Conditions.

B. Shop Drawings: Submit the following:

1. Complete detailed drawings of all valves.

2. Working drawings, including arrangement and erection drawings of the operators and control equipment; schematic control diagrams, electrical connection diagrams, and complete description of the control system; and operating characteristics.

C. Quality Control Submittals: Submit the following:

1. If requested, manufacturer's performance and material records.

2. If requested, complete calculations for each size of motor operator indicating the force required to operate the valve, the operator force provided, full load and locked rotor current, and horsepower.

D. Operation and Guarantee Service: Submit operation and guarantee service manuals for the valve operators.

1.5 QUALITY ASSURANCE

A. Furnish all valves of the same type from the same manufacturer. Provide parts that are interchangeable for all valves of the same type and size.

1.6 DELIVERY, STORAGE AND HANDLING

A. General: Deliver, store and handle all products as specified in the DDC General

Conditions and as follows.

B. Historical Performance: Furnish and install eccentric plug valves of a type that has shown successful performance for a minimum of three years.

C. Tests: Furnish a letter confirming that all plug valves have been satisfactorily tested as specified, prior to shipment.

D. Storage and Erection: Pack and store all valves in satisfactory operating condition. Carefully erect all valves in their respective positions, free from all distortion and strain.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted as an "approved equal".

1. Gate Valves:
   a. American Flow Control
   b. M&H Valve Company
   c. Mueller Company
   d. NIBCO, Inc.
   e. Stockham
   f. United States Pipe and Foundry

2. AWWA Butterfly Valves:
   a. American Flow Control
   b. DeZurik
   c. Keystone
   d. Pratt

3. Eccentric Plug Valves:
   a. DeZurik

4. Lubricated Plug Valves:
   a. Crane (2 inches in diameter and smaller)
   b. DeZurik (2 inches in diameter and smaller)
   c. Homestead (2-1/2 inches in diameter and larger)
   d. Rockwell (2-1/2 inches in diameter and larger)
   e. Walworth (2-1/2 inches in diameter and larger)

5. Single Disc Swing Check Valves:
   a. American Flow Control
   b. Clow Valve Company
   c. M&H Valve Company

d. Mueller Company

6. Double Disc Check Valve:
   a. Crane Stockham Valve Ltd.
   b. APCO

7. Solenoid:
   a. Automatic Switch Company
   b. Magnetrol

8. Globe and Angle Valves:
   a. NIBCO, Inc.
   b. Stockham

2.2 MATERIALS

A. General:

1. Fabricate valves of materials resistant to corrosion for the required service.

2. Unless other materials are needed for corrosion resistance or are specified elsewhere, fabricate valves that are to be installed in metal pipelines and that are 2 inches in diameter and smaller of all brass or bronze, except fabricate the handwheel of ASTM A 197 malleable iron. Fabricate valves that are to be installed in metal pipelines and that are 2-1/2 inches in diameter and larger of the materials specified herein.

3. Fabricate gate, globe and angle valves with a minimum steam working pressure rating of 125 psig and a minimum nonshock cold water, oil or gas pressure rating of 200 psig, unless otherwise specified.

4. Fabricate operators of materials resistant to corrosion for the required services. Provide operator materials as specified.

5. Operator housings and pedestal handwheels:

a.	Cast iron	ASTM A 126, Class B ASTM A 48, Class 30 or 35
b.	Ductile iron	ASTM A 395 ASTM A 536, Grade 65-45-12
c.	Cast steel	ASTM A 27/A27M

6. Operator worms, steel — ASTM A 29/A29M Grade Designation 8620

7. Operator gears, steel (spur & helical) ASTM A 572/A572M

8. Worm gears, bronze ASTM B 148, Alloy C95400 or C95500
ASTM B 584, Alloy C86300

B. Valve Joints

1. Fabricate valves 2 inches in diameter and smaller of the threaded or solder end type for valves to be installed in copper pipelines, and of the threaded end type for valves to be installed in metal pipelines.

2. Fabricate all valves 2-1/2 inches in diameter and larger, except bronze valves 2-1/2 and 3 inches in diameter, with flanged ends, unless otherwise specified.

3. Fabricate bronze valves 2-1/2 and 3 inches in diameter with solder or threaded type ends for valves installed in copper pipelines and threaded type ends for all other pipelines.

4. For metallic flanged joints, provide flanges that are faced accurately at right angles to the axis of the casting. Face and drill flanges and shop coat with a rust-preventive compound before shipment.

5. For flanged joints, provide flanges whose dimensions and drillings meet the requirements of ASME B16.1, 125 pounds as a minimum. For valves installed in pipelines with test pressure requirements higher than 125 psi, provide flanges whose pressure ratings equal or exceed the specified test pressure of the pipeline. Furnish special drillings where required. For valves having flanges that do not conform with the thickness requirements of ASME B16.1, test each valve in accordance with the hydrostatic shell test pressure requirements of ASME B16.1.

C. Operating Force: Fabricate valves to limit the maximum force required to operate all manual valves, including but not limited to valves with wrench operated nuts, levers, handwheels and chainwheels, to 40 pounds. Limit the overall length of each wrench or single-arm lever to 18 inches. Limit the overall length of each dual-arm lever to 36 inches.

D. Handwheel: Mark each valve handwheel with an arrow and the word OPEN. Mark each nut with an arrow.

E. Manually Operated Valves: Equip all manually operated valves that have operating nuts, levers or handwheels and that are more than 7 feet above the floor with chain operated levers or chainwheels. Extend chains to 7 feet above the floor.

2.3 GATE VALVES

A. Materials: Unless otherwise shown or specified, furnish and install gate valves meeting the following requirements:

Nominal Valve Size, Inches	Standard	Type
3 and smaller	MSS SP-80	Solid wedge
4 thru 12 for HVAC Service	MSS SP-70	Solid Wedge
4 thru 12, except for HVAC Service	AWWA C509	Resilient seat
16 and larger, except for HVAC Service	AWWA C500	Double disc

B. Rising Stems: All gates must be manufactured with rising stems, unless otherwise shown or specified. All gate valves provided must open when the nut or handwheel is turned counterclockwise.

C. Nonrising Stem: For buried service, furnish nonrising stem gate valves. Nonrising stem valves, except for buried or submerged service, must be equipped with externally visible indication of the disc position at all points of travel.

D. Stem Seals: Use the following types of stem seals:

Valve Type	Stem Seal
Nonrising stem	O-ring Stuffing box
Rising stem (Outside stem and yoke)	
Geared	
Nonrising stem	O-ring or stuffing box
Rising stem (Outside stem and yoke)	Stuffing box

E. Packing: Provide nonasbestos braided, twisted or formed ring type packing suitable for the pressure-temperature ratings of the valve.

F. Bonnet: Provide 3-inch and smaller gate valves with threaded bonnets. Provide 4-inch and larger gate valves with outside screw and yoke bonnets.

G. Accessories: Provide zinc plated bonnet bolts, studs and nuts, except for submerged service. Provide stainless bonnet bolts, studs and nuts for submerged service. Make wedging devices must be bronze to iron or bronze to bronze. Provide glands which are bronze or bronze brushed and bronze gland bolts and nuts.

2.4 BUTTERFLY VALVES

A. General:

1. Provide butterfly valves 4 inches and smaller of the full lug pattern with drilled and tapped bolt holes.

2. Provide butterfly valves 6 inches and larger of the full flanged pattern that meet the requirements of AWWA C504.

3. Provide butterfly valves of the rubber-seated, tight-closing type.

4. For fluid temperatures equal to or less than 180 degrees F, provide Buna-N seats. For fluid temperatures greater than 180 degrees F, provide EPDM or Viton seats. For fluid temperatures exceeding the temperature ratings of EPDM and Viton, provide seats that are appropriate for the intended service.

B. Materials:

1. For butterfly valves 4 inches and smaller, provide valve materials as specified below or as required for the service.

a.	Valve bodies:	
	Cast iron	ASTM A 126, Class B
b.	Valve shafts:	
	Stainless steel	ASTM A 564, Type 630 (17-4 PH stainless steel) ASTM A 276 Grade 316
c.	Valve discs:	
	Aluminum Bronze	ASTM B 148
	Bronze	ASTM B 30
	Bearings:	TFE coated stainless steel

2. For butterfly valves larger than 4 inches, provide valve materials as specified below or as required for the service:

a.	Valve bodies:	
	Cast iron	ASTM A 126, Class B ASTM A 48, Class 40
b.	Valve shafts:	ASTM A 276 or A 479/A479M, Type 304, stainless steel or carbon steel with A 276 or A 479, Type 304 stainless steel journals

c.	Valve discs:	
	Cast iron	ASTM A 48, Class 40
	Alloy cast iron	ASTM A 436, Type 1
	Ductile iron	ASTM A 536, Grade 65-45-12
	Bronze	AWWA C504 Grade A, D or E
d.	Mating seat surface:	
	Stainless steel castings)	ASTM A 743/A743M, A 744 Grade CF-8 or CF-8M
	Stainless steel	ASTM A 276 or A479,Type 304
	Alloy cast iron	ASTM A 436, Type 1
e.	Seats:	Buna-N (Wastewater) New natural rubber or Buna-N (Water) Neoprene (Air)

C. General AWWA C504 Construction: For butterfly valves 6 inches and larger, provide valves and all accessories, including operators, that meet the requirements of AWWA C504, except as otherwise specified. Provide valve bodies of the short-body flanged type or mechanical joint-end type, as shown or specified. Wafer body type valves without lugs are not acceptable.

D. Pressure: Provide butterfly valves of pressure classes that are not less than Class 25B, that exceed the pipeline test pressure in which the valve is installed, or that are as specified, whichever is greatest.

E. Shafts: Provided shafts must have their shafts extented a minimum of 1-1/2 diameters into the discs. Provide clearance between the shaft and discs not exceeding the following:

Shaft Diameter (Inches)	Maximum Radial Clearance (Inches)
1/2 to 1-1/2	.002
2 to 4	.0025
5	.003
6	.004

F. Extended Necks: Provide butterfly valves in insulated lines with extended necks to clear insulation.

2.5 SINGLE DISC SWING CHECK VALVES

A. General: Provide single disc swing check valves engineered to allow a full diameter passage and to operate with a minimum loss of pressure. Provide 1/8 through 3 inch check valves that meet the requirements of MSS SP-80. Except as specified herein, provide 4 inch through 24 inch check valves that meet the requirements of AWWA

C508. For heating, ventilating or air conditioning service, provide 4 inch through 24 inch check valves that meet the requirements of MSS SP-71.

B. Engineering Requirements: Equip check valves with bronze renewable seat rings, bronze discs or disc rings and bronze disc hinge bushings and pins. Carefully mount discs and provide discs that swivel in disc hinges. Provide pins, discs and other parts that are noncorrosive, nonsticking and properly cured to operate satisfactorily within a temperature range of 34 to 100 degrees Fahrenheit and with the fluids or gases specified.

C. Levers and Weights: Equip 6 inch and larger check valves with outside levers and weights.

2.6 DOUBLE DISC CHECK VALVE

A. General: Provide double disc check valves that are of the double plate and flat seat type with a center located, vertical hinge pin. Design the valves for tight shutoff under all reverse flow and head conditions.

B. Working Pressure: Design the valves for a minimum working pressure of 125 pounds per square inch. Provide end connections that are engineered to fit between ASME B16.1 flanges.

C. Construction Materials: Construct the valve body and discs of cast iron. Provide Buna-N seal materials. Use stainless steel Type 316 springs.

2.7 HOSE VALVES

A. General: Provide globe or angle type hose valves with rising stems, cap, chain and rubber composition discs for cold water pressures up to 200 psi, nonshock.

B. Construction: Manufacture hose valves of all bronze or brass, except the handwheels which may be malleable iron. Conform hose threads to ANSI B2.4.

2.8 GLOBE AND ANGLE VALVES

A. General: Provide globe and angle valves that meet the requirements of MSS SP-80.

B. Disc and Seats: Equip gate and globe valves with renewable bronze discs and renewable seats.

C. Bonnet: Equip globe and angle valves with threaded bonnets.

D. Packing: Provide nonasbestos braided, twisted or formed ring type packing suitable for the pressure-temperature ratings of the valve.

2.9 MANUAL BUTTERFLY VALVE OPERATORS

A. General: Provide operators as an integral part of the valve. Provide manual operators of the enclosed, hand-lever, traveling-nut or worm-gear type, as shown or specified.

B. Hand-Lever Type: Fabricate hand-lever type operators of cast-iron or steel construction with a nonmetallic, nonslip handgrip. Equip the lever with a locking device to secure the valve disc in the fully open or fully closed position, or at a minimum of 5 intermediate positions equal intervals. Provide mechanical stop-limiting devices to prevent overtravel of the disc in either direction. Permanently lubricate operators or provide operators with grease fittings.

C. Traveling-Nut Type: Fabricate traveling-nut type operators with a threaded steel screw and a bronze nut. Provide a slotted-lever or link-lever system to transfer the applied torque to the disc shaft. Equip all rotating shafts, screws and links with separate bearings. Provide thrust bearings.

D. Worm-Gear Type: Fabricate worm-gear type operators with a worm gear and matching drive worm. Provide bearings for each rotating member.

E. Stop-Limiting Devices: Provide stop-limiting devices on traveling-nut and worm-gear type operators to prevent overtravel of the disc in either direction. Engineer the operator to hold the disc in any position without flutter or wear on the valve or operator. House the operator in a watertight enclosure. Pack operators with grease or with oil. For buried or submerged service, equip valve operators with stainless steel external bolting.

F. Position Indicators: For buried or submerged service, equip manually operated butterfly valves, with externally visible indication of the disc position.

2.10 CHAINWHEEL OPERATORS

A. General: Manufacture chainwheels and chain guides of cast iron or ductile iron. Coat chainwheels and chain guides by hot dip galvanizing in accordance with the requirements of Section 05 08 10.

B. Chains: Manufacture chain of steel. Use welded link chain meeting the requirements of the National Association of Chain Manufacturers (NACM) Grade 28 or single loop weldless chain meeting the requirements of NACM No. 6001. Coat chain by hot dip galvanizing meeting the requirements of Section 05 08 10. Remove excess metal at welded chain joints for proper fit into the chainwheel pockets. Remove burrs and sharp edges. Furnish chain that is suitable for bare hand operation.

2.11 FLOOR AND BENCH STANDS

A. General: Provide floor and bench stands for valves smaller than 12 inches of the wheel operated type without gears. Provide stands for 12- to 20-inch valves of single crank, single speed operated. Provide stands for 24-inch and larger valves of single crank, single speed or 2-speed operated as specified.

B. Materials: Use materials in floor and bench stands meeting the applicable requirements of the "General" specifications Subsection 2.2.A. Provide frames of cast iron or fabricated steel of heavy and substantial size with smooth exterior and neat appearance. Make adequate provision for lubrication and protect all operating parts.

C. Nameplate and OPEN Indication Marking: Equip each stand with a nameplate stating the valve controlled by the stand. The operator must be stamped with an arrow and the word OPEN to indicate the direction of rotation.

D. Rising Stems: Fit rising stem floor and bench stands with ball or roller bearings engineered to take the thrust. Equip rising stem stands with a transparent plastic cover to protect the stem. Provide the cover with labels and other attachments that will facilitate its use as an indicator of valve position.

E. Nonrising Stems: Fit nonrising stem floor and bench stands with thrust ball or roller bearings. Provide an indicator to show the position of the valve.

F. Operating and Lift Nuts: Provide operating nuts or lift nuts of bronze meeting the requirements of ASTM B 62, finished all over, suitably splined to connect with the handwheel or gear and with threads which will engage smoothly with those of the lifting shaft.

G. Crank-Operated Stands: Provide crank-operated stands with a crank that will open the valve when the crank is turned counterclockwise. Locate the center of the crank approximately 36 inches above the operating floor. Provide gears which are bevel or worm, of hardened steel or manganese bronze, with machine cut teeth and enclosed in a cast-iron body. Equip the crank with a brass or bronze sleeve-type handgrip rotating freely on the handle. Utilize a gear ratio that will enable the stand to operate the valve with a maximum force of 40 pounds on the crank at single or low speed.

H. Handwheel-Operated Stands: Provide handwheel-operated stands with handwheels that open the valve when the wheel is turned counterclockwise. Locate the center of the handwheel approximately 36 inches above the operating floor. Provide a handwheel of sufficient diameter so that the stand will operate the valve with a maximum pull on the handwheel of 40 pounds.

I. Manually Operated Bench Stands: Equip manually operated bench stands located more than 7 feet above the floor with chains and chainwheels that meet the requirements of the Subsection 2.10 "Chainwheel Operators".

2.12 EXTENSION STEMS, VALVE BOXES AND FLOOR BOXES

A. Equip all direct burial valves and valves in vaults or manholes with operating nuts and extended shafts to grade, unless otherwise shown or specified. Equip all direct burial valves with adjustable type, cast-iron, valve boxes and extended shafts to grade. Equip all valve boxes and floor boxes with ground level valve position indicators, unless otherwise shown or specified. Provide two tee wrenches for each size and type of operating nut.

PART III - EXECUTION

3.1 INSTALLATION

A. General: Install valves in accordance with the manufacturer's recommendations and approved shop drawings and as specified in the DDC General Conditions.

B. Eccentric Plug Valves: Unless otherwise shown or specified for eccentric plug valves installed in horizontal piping, orient the valve such that the shaft is in the horizontal position, the seat is in the downstream position and when the valve is in the open position the plug is up. Unless otherwise shown or specified, for eccentric plug valves installed in vertical piping, orient the valve with the plug up when the valve is in the closed position.

C. Floor and Bench Stands: Accurately center floor and bench stands over the valve. Accurately bolt stands to the floor or support structure, with through-bolts wherever possible. Place approximately 3/4 inch of nonshrink cement grout beneath stands mounted on concrete or similar construction to assure uniform support. For stands installed within the area of a removable type floor, platform, or grating, securely mount them on their own support structure independent of the removable element, unless otherwise shown or specified.

3.2 PAINTING AND COATING

A. General: Unless otherwise specified, coat the inside iron or steel surfaces of all valves and exterior surfaces of valves and operators that are to be buried in the ground or immersed in sewage or water with two coats of asphalt varnish.

3.3 FIELD QUALITY CONTROL

A. Tests: After installation of the valves, control equipment and all appurtenances, subject the units to a field running test, as specified in the DDC General Conditions, under actual operating conditions. Operate each valve through one complete open-close cycle under the maximum pressure differential practical.

3.4 PAINTING

A. Paint the equipment in accordance with the requirements in the Contract Drawings.

3.5 SCHEDULE

A. Abbreviations used in the schedule are as follows:

Joints

B&S	Bell and Spigot
F	Flanged
G	Grooved End
Lu	Lug
MJ	Mechanical Joint
Sc	Screwed
Sd	Soldered
SW	Solvent Welded
W	Welded

Operators

AC	Air-Oil Cylinder
BS	Bench Stand
D	Diaphragm
E	Electric Motor (Nonmodulating)
F	Float
FS	Floor Stand
H	Handwheel
HC	Hydraulic Cylinder (High Pressure)
L	Lever
ME	Modulating Electric Motor
N	Nut
PC	Pneumatic Cylinder
S	Solenoid
WC	Water Cylinder (Low Pressure Hydraulic Cylinder)

VALVE SCHEDULE

Facility/Service	Valve Type	Size Inches	Joint Type	Operator Type	Remarks
BURIED PIPELINES					
Potable Water	Gate	3 - 8	MJ	N	Extension Stem
Potable Water	Ball Valve	0 - 2	Sd		W/True Unions. Refer to Specification 22 10 00

END OF SECTION 40 05 20

YU · PARSONS BRINCKERHOFF
A Joint Venture

May 1, 2013
YU's Project #12207
YU-PB Contract #20121440891

Mr. Sherien Thampi, P.E.
Bureau of Environmental & Geotechnical Services

New York City Department of Design + Construction
30-30 Thomson Avenue
Long Island City, New York 11101

RE: Geotechnical Laboratory Test Results
BEGS2012006
Newtown Creek Nature Walk Phase II and III
Newtown Creek Wastewater Treatment Plant
329 Greenpoint Avenue, Brooklyn NY
Task ID# 8662 Geotechnical II: Project Oversight
SES-4013, J-3486

Dear Mr. Thampi:

As part of YU-Parsons Brinckerhoff Joint Venture (JV) deliverables for the referenced project, attached please find a copy of the geotechnical laboratory test results for your use. The geotechnical laboratory testing program was previously approved by your office. The actual tests were performed by our subconsultants; Converse Consultants and TerraSense, LLC. If you have any questions, please feel free to contact us.

Very truly yours,
YU- PARSONS BRINCKERHOFF, JV



Jeffrey K. Au, P.E.
Project Manager

Attachments: Appendix A – Geotechnical Laboratory Test Results Prepared by Converse Consultants
Appendix B – Geotechnical Laboratory Test Results Prepared by TerraSense LLC.

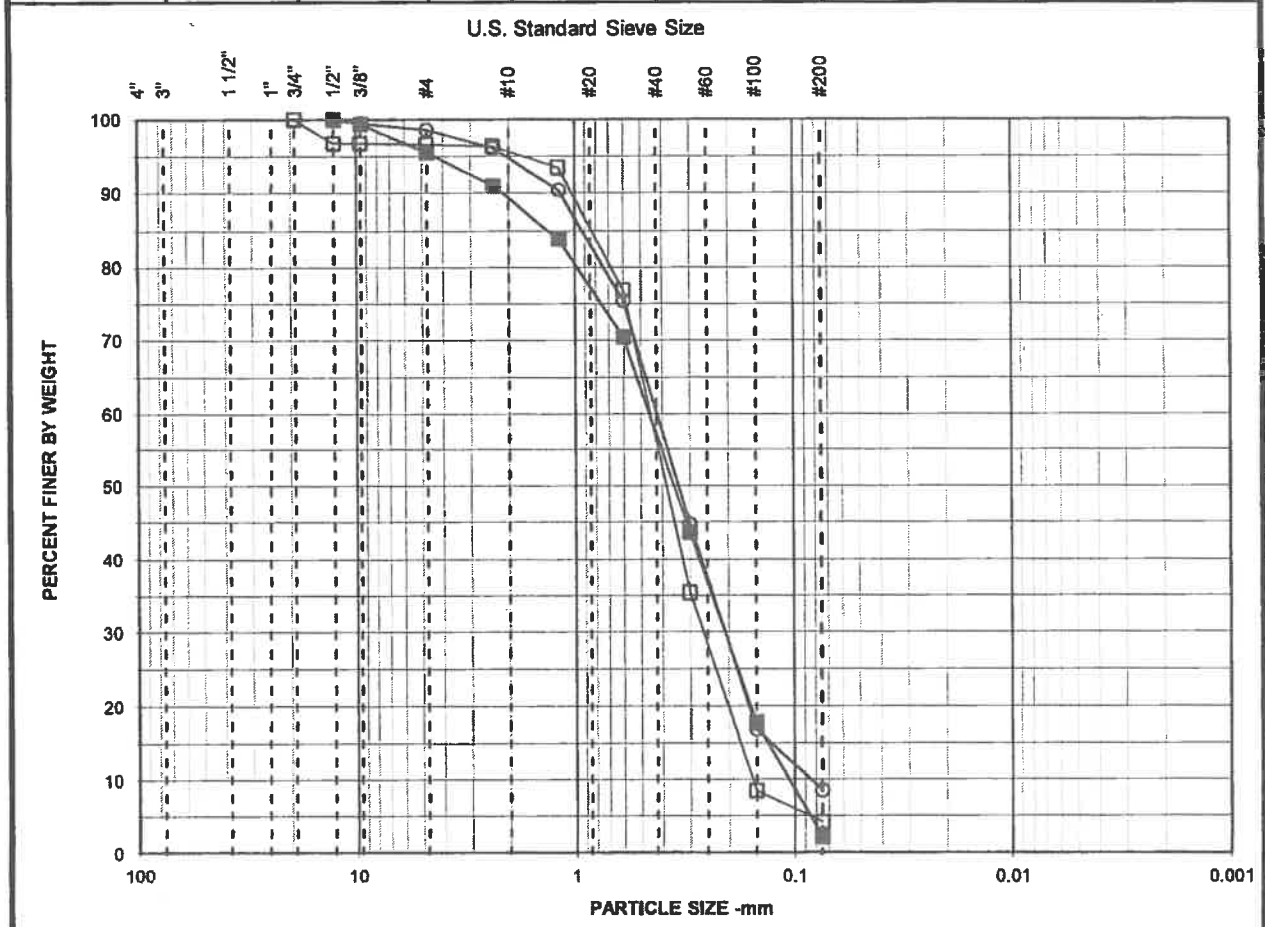
cc:

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APPENDIX A

Geotechnical Laboratory Test Results

Prepared by Converse Consultants



Symbol	□	■	○
Boring	B-1	B-2	B-3
Sample	S-7	S-6	S-7
Depth	30-32	30-32	30-32
% Gravel	3.4	4.5	1.4
% Sand	92.4	93.4	90.1
% Fines	4.2	2.1	8.5
% -2μ			
C_c	0.94	0.87	1.17
C_u	2.81	4.18	4.67
D_{100} (mm)	19.05	12.70	12.70
D_{60} (mm)	0.45	0.46	0.42
D_{30} (mm)	0.26	0.21	0.21
D_{10} (mm)	0.16	0.11	0.09
LL			
PI			
USCS	SP	SP	SP-SM
w (%)	19.2	15.8	15.2 (?)

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
1"			
3/4"	100.0		
3/8"	96.8	99.4	99.5
#4	96.6	95.5	98.6
#10	95.6	89.3	94.7
#20	85.4	77.3	83.1
#40	56.3	57.1	60.1
#60	28.3	36.8	37.4
#100	8.5	17.7	16.8
#200	4.2	2.1	8.5

SYMBOL	DESCRIPTION AND REMARKS
□	Grey f*-m SAND, trace silt, trace gravel
	note: fines assumed to be non-plastic for classification
■	Grey f*-m SAND, trace gravel trace silt
	note: fines assumed to be non-plastic for classification
○	Grey f*-m SAND trace silt, trace gravel
	note: sample jar arrived at lab broken, fines assumed to be non-plastic for classification

PARTICLE SIZE DISTRIBUTION

NYC DDC

Newtown Creek Nature Walk Phases II & III

BEGS2012006

Newtown Creek Wastewater Treatment Plant

Brooklyn, NY

Converse Consultants #11-67100-07

Newtown Creek Nature Walk Phases II & III
BEGS2012006
Newtown Creek Wastewater Treatment Plant
Brooklyn, NY
Converse Consultants #11-67100-07

Boring No.	Sample No.	Depth (feet)	Moisture Content
B-1	S-3a	13-14	155%
B-1	S-3b	14-15	136%
B-1	S-4	16.5-18.5	60%
B-1	S-5	22-24	67%
B-1	S-6	24-26	33%
B-1	S-7	30-32	19%
B-1	S-9	40-42	81%
B-1	S-10	45-47	28%
B-1	S-11	50-52	37%
B-1	S-12	55-57	38%
B-1	S-13	60-62	36%
B-1	S-14	65-67	37%
B-1	S-15	70-72	36%
B-1	S-16	75-77	61%
B-1	S-17	80-82	37%
B-1	S-18	85-87	39%
B-1	S-19	90-92	43%
B-1	S-20	95-97	38%
B-1	S-21	100-102	30%
B-2	S-3	16-17	56%
B-2	S-4	20-21	56%
B-2	S-6	30-32	16%
B-2	S-9	45-47	31%
B-2	S-11	55-57	35%
B-2	S-12	60-62	41%
B-2	S-13	65-67	38%
B-2	S-14	70-72	39%
B-3	S-3	12-14	65%
B-3	S-4	17-19	52%
B-3	S-5a	22-24	19%
B-3	S-5b	22-24	16%
B-3	S-7	30-32	15%
B-3	S-8a	35-37	80%
B-3	S-9	40-42	30%
B-3	S-10	45-47	34%
B-3	S-11	50-52	41%
B-3	S-12	55-57	29%
B-3	S-13	60-62	39%
B-3	S-14	65-67	42%
B-3	S-15	70-75	26%
B-3	S-16	75-77	34%
B-3	S-17	80-82	33%

APPENDIX B

Geotechnical Laboratory Test Results

Prepared by TerraSense LLC

YU & Associates #12207
DDC Term- Newtown Creek Nature Walk
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS							STRENGTH			CONSOLIDATION			REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	TOTAL UNIT WEIGHT (pcf)	DRY UNIT WEIGHT (pcf)	Type Test @ STRESS (tsf)	PEAK DEVIATOR STRESS (tsf)	AXIAL STRAIN @ PEAK STRESS (%)	Method	INITIAL CONDITIONS VOID RATIO (-)	INITIAL CONDITIONS SATUR-ATION (%)	
B-1	U-1	14.5-16.5						100.9								
B-1	U-1	14.75	78.5													
B-1	U-1	15.3	60.9													
B-1	U-1	15.85	59.1													
B-1	U-1C	16.1	59.4	66	32	34	CH	103.6	65.0	UU@0.5	0.5	6.1				UU065e
B-1	U-2	20-22						105.9								
B-1	U-2	20.05	49.9													
B-1	U-2	20.5	51.1													
B-1	U-2	21.05	52.6													
B-1	U-2C	21.3	52.9	56	26	30	CH	104.8	68.6				D2435	1.448	98	C13071
B-1	U-2	21.6	54.9													
B-2	U-1	13-15						100.7								
B-2	U-1	13.05	92.8													
B-2	U-1	13.6	71.8													
B-2	U-1	14.15	58.7													
B-2	U-1	14.7	51.2													
B-2	U-1D	14.95	59.8	70	30	40	CH	103.5	64.8				D2435	1.650	100	C13072
B-2	U-2	17-19						107.8								
B-2	U-2	17.7	53.5													
B-2	U-2	18.25	48.6													
B-2	U-2C	18.5	48.6	62	30	32	CH	108.1	72.8	UU@0.5	1.0	6.2				UU065f
B-2	U-2	18.8	47.2													

Prepared by: TK
Reviewed by: GET
Date: 3/13/2013

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.. 7753-13003
File: Indx1.xls

YU & Associates #12207
DDC Term- Newtown Creek Nature Walk
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS							STRENGTH			CONSOLIDATION			REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	TOTAL UNIT WEIGHT (pcf)	DRY UNIT WEIGHT (pcf)	Type Test @ STRESS (tsf)	PEAK DEVIATOR STRESS (tsf)	AXIAL STRAIN @ PEAK STRESS (%)	Method	INITIAL CONDITIONS VOID RATIO (-)	INITIAL CONDITIONS SATUR-ATION (%)	
B-3	U-1	15-17						107.5								
B-3	U-1	15.3	59.3													
B-3	U-1	15.85	56.7													
B-3	U-1	16.4	58.3													
B-3	U-1C	16.65	58.3	69	33	36	CH	104.0	65.7	UU@0.5	0.8	7.1				UU065g
B-3	U-2	20-22						103.2								
B-3	U-2	20.1	54.6													
B-3	U-2	20.65	57.4													
B-3	U-2	21.2	58.3													
B-3	U-2	21.75	57.2													
B-3	U-2D	22.0	51.9	58	26	32	CH	106.4	70.0				D2435	1.478	98	C13073

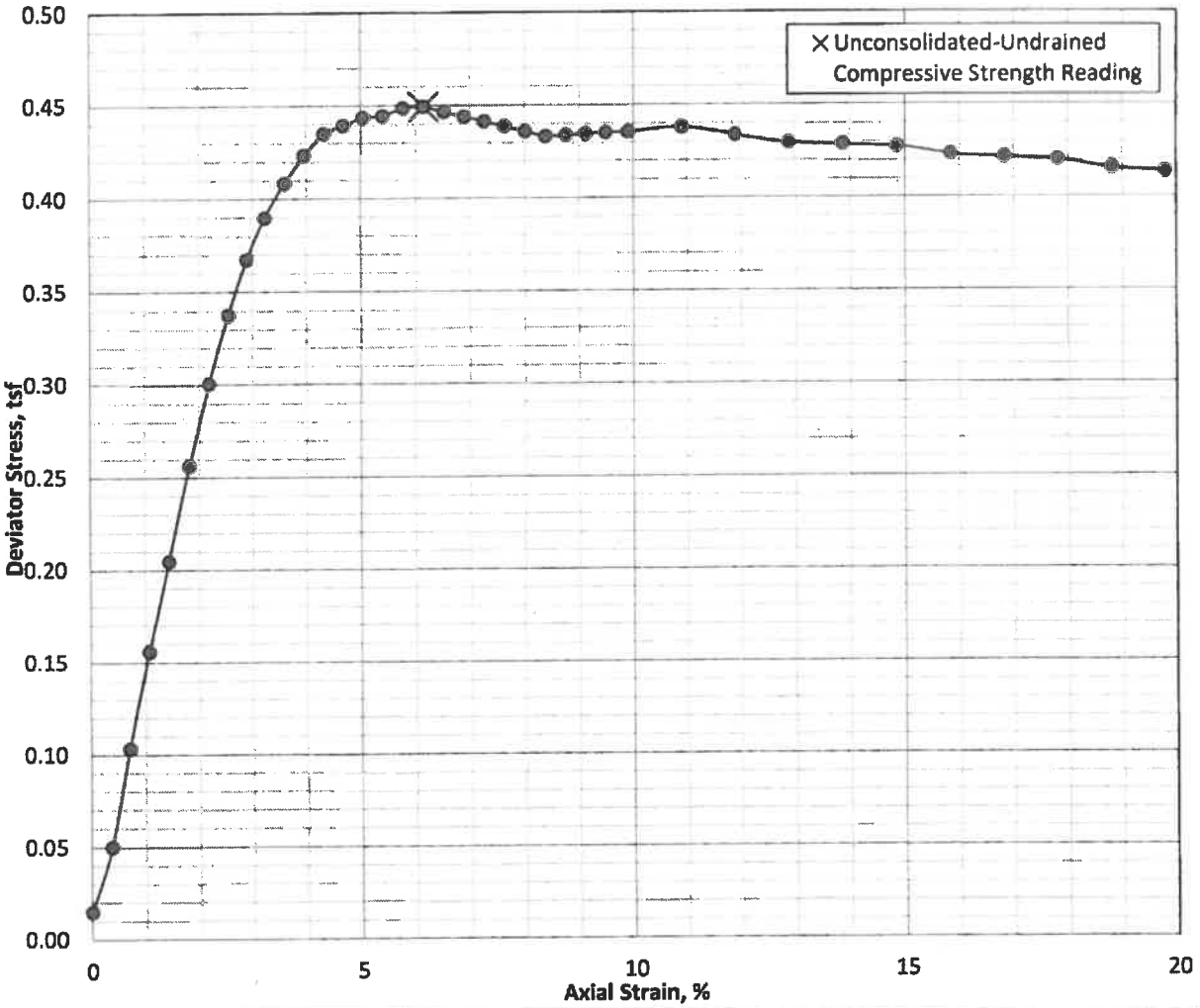
Note: (1) USCS symbol based on visual observation and Atterberg limits reported.

Prepared by: TK
Reviewed by: GET
Date: 3/13/2013

TerraSense, LLC
45H Commerce Way
Totowa, NJ 07512

Project No.: 7753-13003
File: Indx1.xls

UNCONSOLIDATED-UNDRAINED COMPRESSIVE STRENGTH TEST, ASTM METHOD D2850



Specimen and Material Property Information

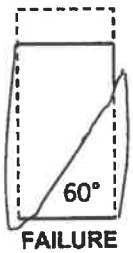
Sample Type: Intact tube sample

Description and/or Classification: CH, gray fat clay; shell fragments, some organics noted

Cell Pressure (tsf)	Water [1] Content (%)	Wet Unit Weight (pcf)	Dry Unit [1] Weight (pcf)	Void Ratio (-)	Saturation [2] (%)	Length (inch)	Diameter (inch)	L/D (-)	LL/ PL (-)	PI (-)	Specific [2] Gravity (-)
0 (Initial)	59.4	103.6	65.0	1.68	98.7	6.035	2.858	2.1	66	34	2.79
0.5	59.4	104.4	65.5	1.66	99.9	6.020	2.851	2.1	32		

Failure Summary

U-U Compressive Strength (tsf)	U-U Shear Strength, s_u (tsf)	Strain to to Peak (%)	Strain Rate (%/min)
0.45	0.225	6.1	0.74



FAILURE SKETCH

Remarks and Notes:

(1) Water Content determined after shear from partial specimen.

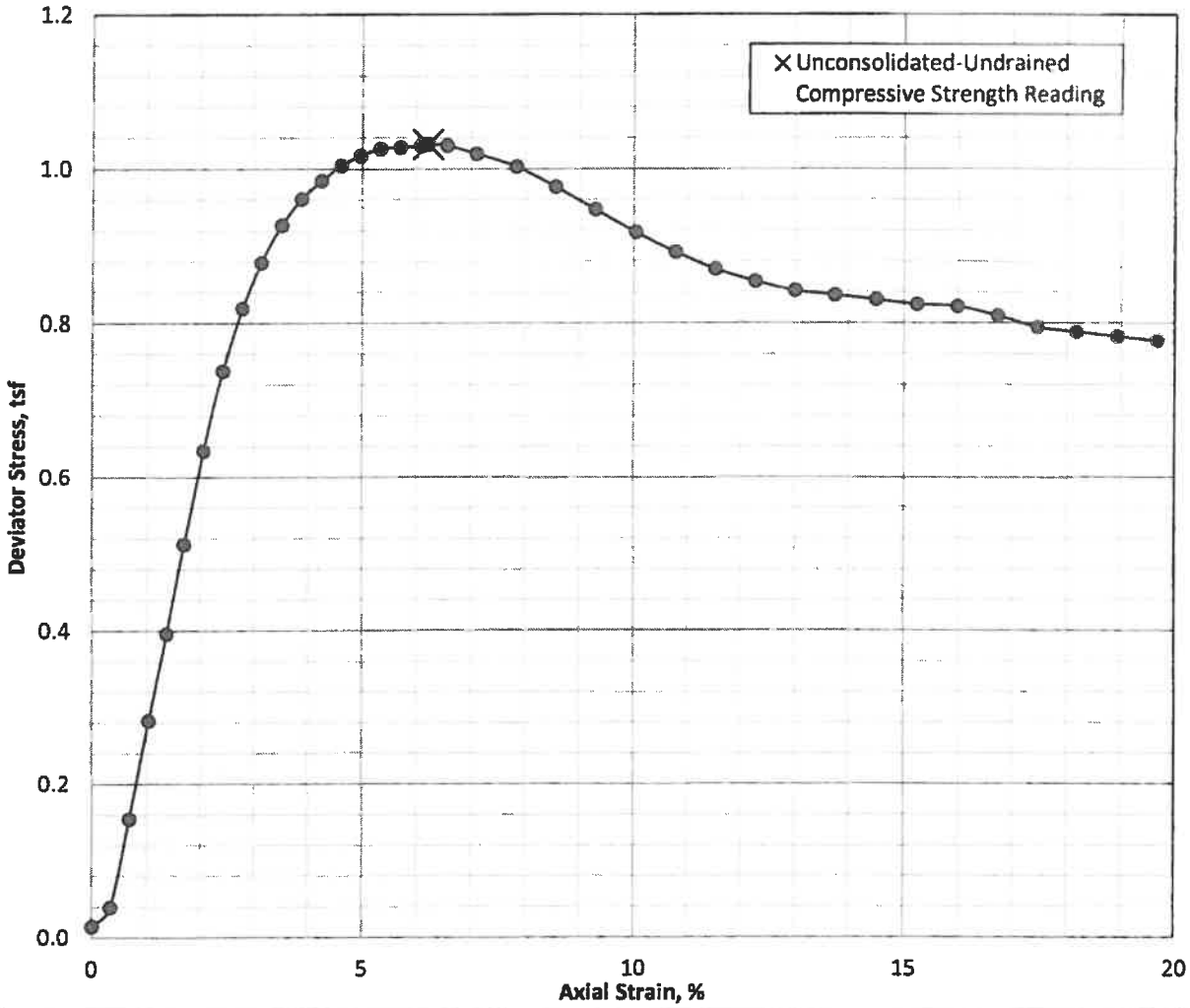
(2) Assumed specific gravity

Tested by: DT Reviewed by: CMJ

Test Date: 3/6/2013 Review Date: 3/12/2013

YU & Associates Project # 12207	**DDC Term** Newtown Creek Nature Walk	**UNCONSOLIDATED-UNDRAINED COMPRESSION TEST** Boring: B-1 Sample: U-1 Section: C Depth: 16.1 ft.
TerraSense, LLC Project # 7753-13003		

UNCONSOLIDATED-UNDRAINED COMPRESSIVE STRENGTH TEST, ASTM METHOD D2850



Specimen and Material Property Information

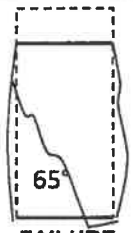
Sample Type: Intact tube sample

Description and/or Classification: CH, gray fat clay; shell fragments, some organics noted

Cell Pressure (tsf)	Water Content [1] (%)	Wet Unit Weight (pcf)	Dry Unit Weight [1] (pcf)	Void Ratio (-)	Saturation [2] (%)	Length (inch)	Diameter (inch)	L/D (-)	LL/PL (-)	PI (-)	Specific Gravity [2] (-)
0 (Initial)	48.6	108.1	72.8	1.37	98.1	6.044	2.857	2.1	62	32	2.76
0.5	48.6	109.3	73.6	1.34	100.0	6.022	2.846	2.1	30		

Failure Summary

U-U Compressive Strength (tsf)	U-U Shear Strength, s_u (tsf)	Strain to to Peak (%)	Strain Rate (%/min)
1.03	0.515	6.2	0.73



FAILURE SKETCH

Remarks and Notes:

(1) Water Content determined after shear from partial specimen.

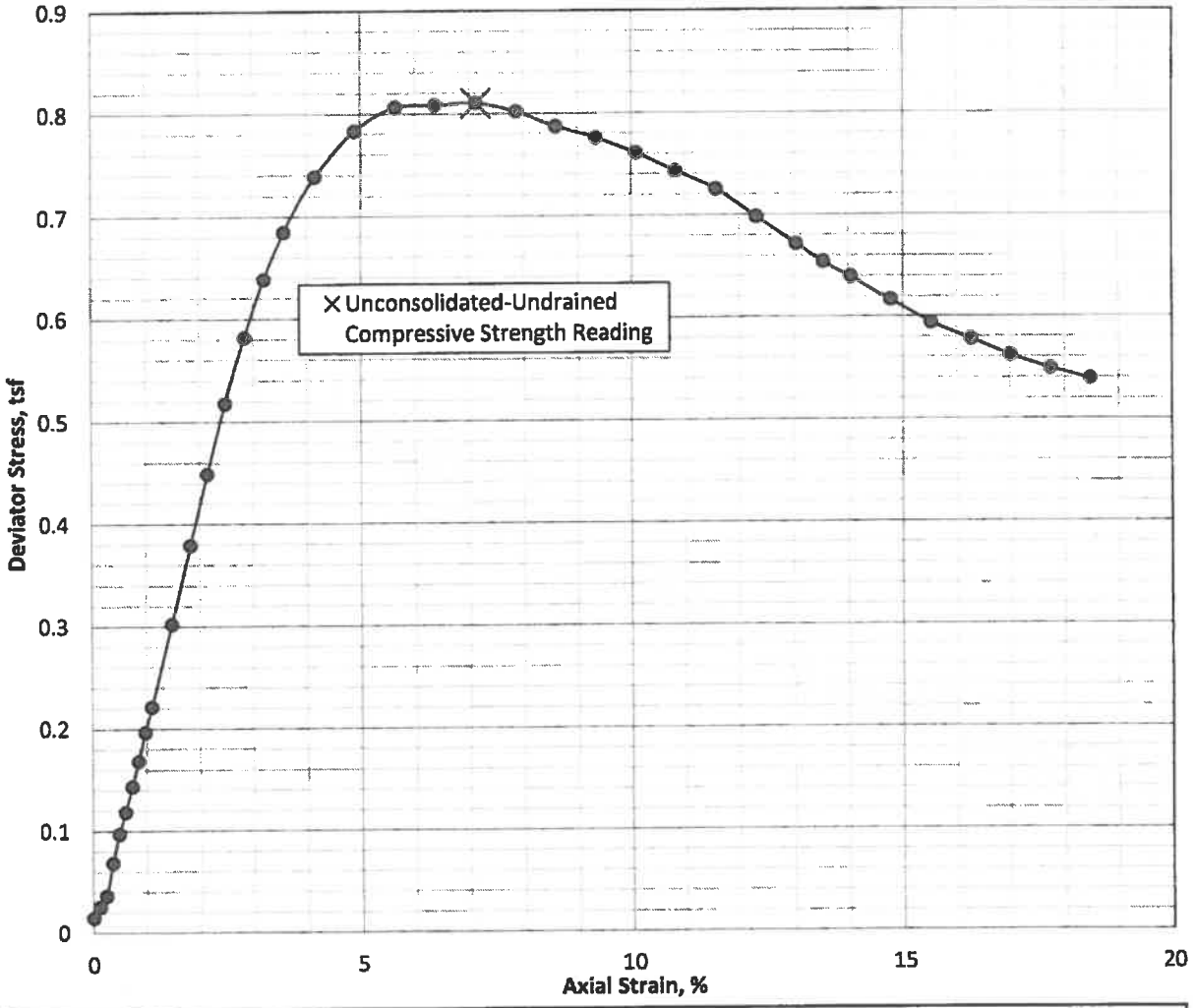
(2) Assumed specific gravity

Tested by: DT Reviewed by: CMJ

Test Date: 3/6/2013 Review Date: 3/12/2013

YU & Associates Project # 12207	**DDC Term** Newtown Creek Nature Walk	**UNCONSOLIDATED-UNDRAINED COMPRESSION TEST**
TerraSense, LLC Project # 7753-13003		Boring: B-2 Sample: U-2 Section: C Depth: 18.5 ft.

UNCONSOLIDATED-UNDRAINED COMPRESSIVE STRENGTH TEST, ASTM METHOD D2850



Specimen and Material Property Information

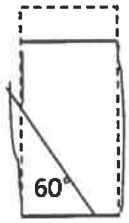
Sample Type: Intact tube sample

Description and/or Classification: CH, gray fat clay; shell fragments, trace organics noted

Cell Pressure (tsf)	Water Content [1] (%)	Wet Unit Weight (pcf)	Dry Unit Weight [1] (pcf)	Void Ratio (-)	Saturation [2] (%)	Length (inch)	Diameter (inch)	L/D (-)	LL/PL (-)	PI (-)	Specific Gravity [2] (-)
0 (Initial)	58.3	104.0	65.7	1.63	99.1	6.020	2.850	2.1	69	36	2.77
0.5	58.3	104.7	66.1	1.62	100.1	6.008	2.844	2.1	33		

Failure Summary

U-U Compressive Strength (tsf)	U-U Shear Strength, s_u (tsf)	Strain to to Peak (%)	Strain Rate (%/min)
0.81	0.405	7.1	0.74



FAILURE SKETCH

Remarks and Notes:

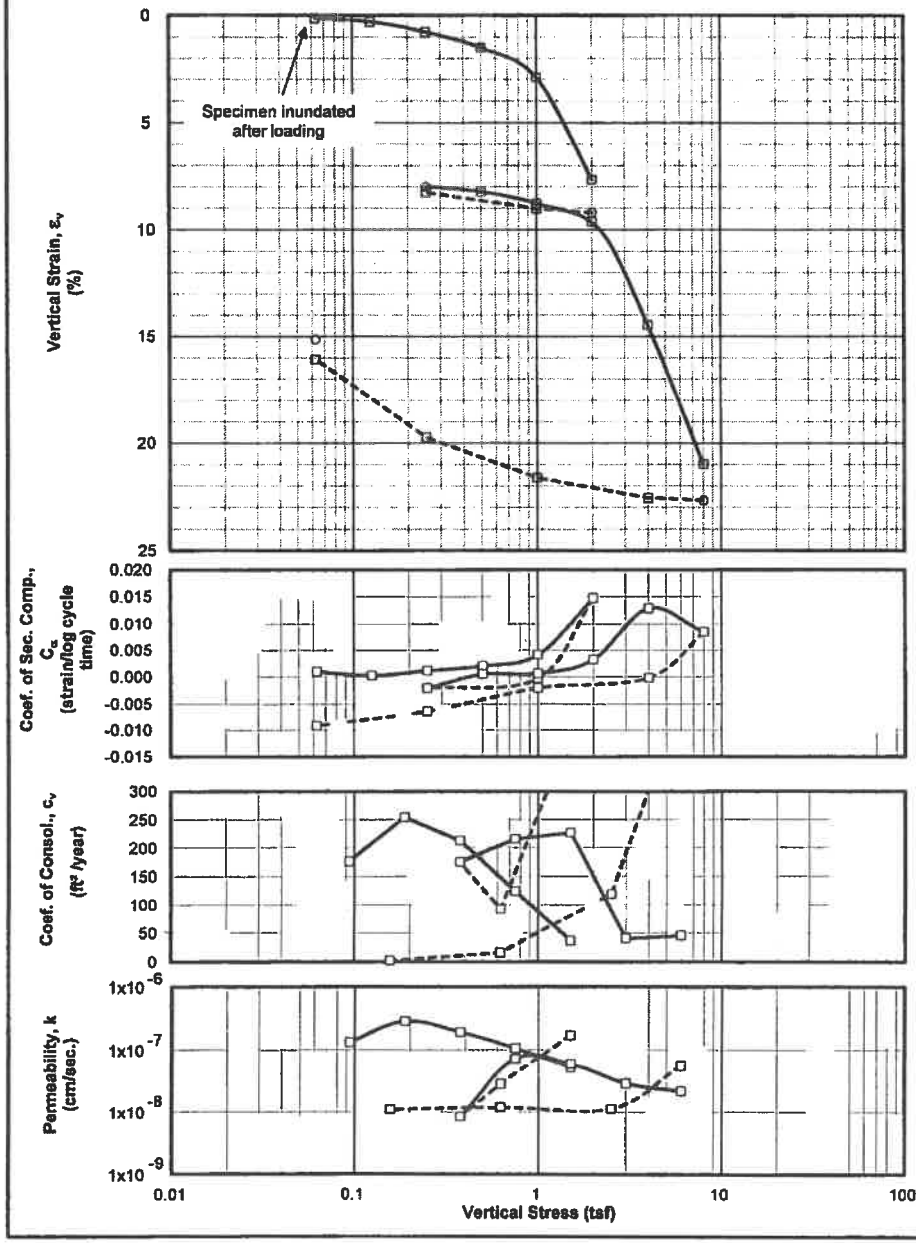
(1) Water Content determined after shear from partial specimen.

(2) Assumed specific gravity

Tested by: DT Reviewed by: CMJ

Test Date: 3/6/2013 Review Date: 3/12/2013

YU & Associates Project # 12207	**DDC Term**	**UNCONSOLIDATED-UNDRAINED COMPRESSION TEST**
TerraSense, LLC Project # 7753-13003	**Newtown Creek Nature Walk**	**Boring: B-3 Sample: U-1** Section: C Depth: 16.65 ft.



SAMPLE INFORMATION

Boring:	B-1
Sample:	U-2C
Depth:	21.30 feet
Elevation:	
Type:	3-inch thin wall tube
Description:	CH, gray fat clay; shell fragments, some organics noted

LL = 56, PL = 26, PI = 30

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height:	0.62	inch
Diameter:	2.50	inch

Initial water content:	52.9	%
Initial total unit weight:	104.8	pcf
Initial dry unit weight:	68.6	pcf
Initial void ratio:	1.448	
Initial degree of saturation:	98	%
Final water content:	41.9	%
Final total unit weight:	112.1	pcf
Final dry unit weight:	79.0	pcf
Final void ratio:	1.126	
Final degree of saturation:	100	%

(assumed specific gravity = 2.69)

TEST SUMMARY

Construction Method:	Casagrande (Log)
Estimated preconsolidation stress (tsf):	1.3 (Range: 1.2 to 1.4)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.216
Compression Index (void ratio per log cycle stress):	0.529
Swell Ratio (strain per log cycle stress):	0.013
Swell Index (void ratio per log cycle stress):	0.032
Recompression Ratio (strain per log cycle stress):	0.016
Recompression Index (void ratio per log cycle stress):	0.039
Remarks:	

LEGEND: □ End of primary ○ End of Stage ——— Loading - - - - - - - Unloading

Test Date: 3/5/13 Tested By: TK/CMJ Checked By: GET

YU & Associates Project No. 12207	DDC Term Newtown Creek Nature Walk	ONE DIMENSIONAL CONSOLIDATION TEST Boring: B-1 Depth: 21.30 feet
TerraSense, LLC	Project No. 7753-13003	March 2013

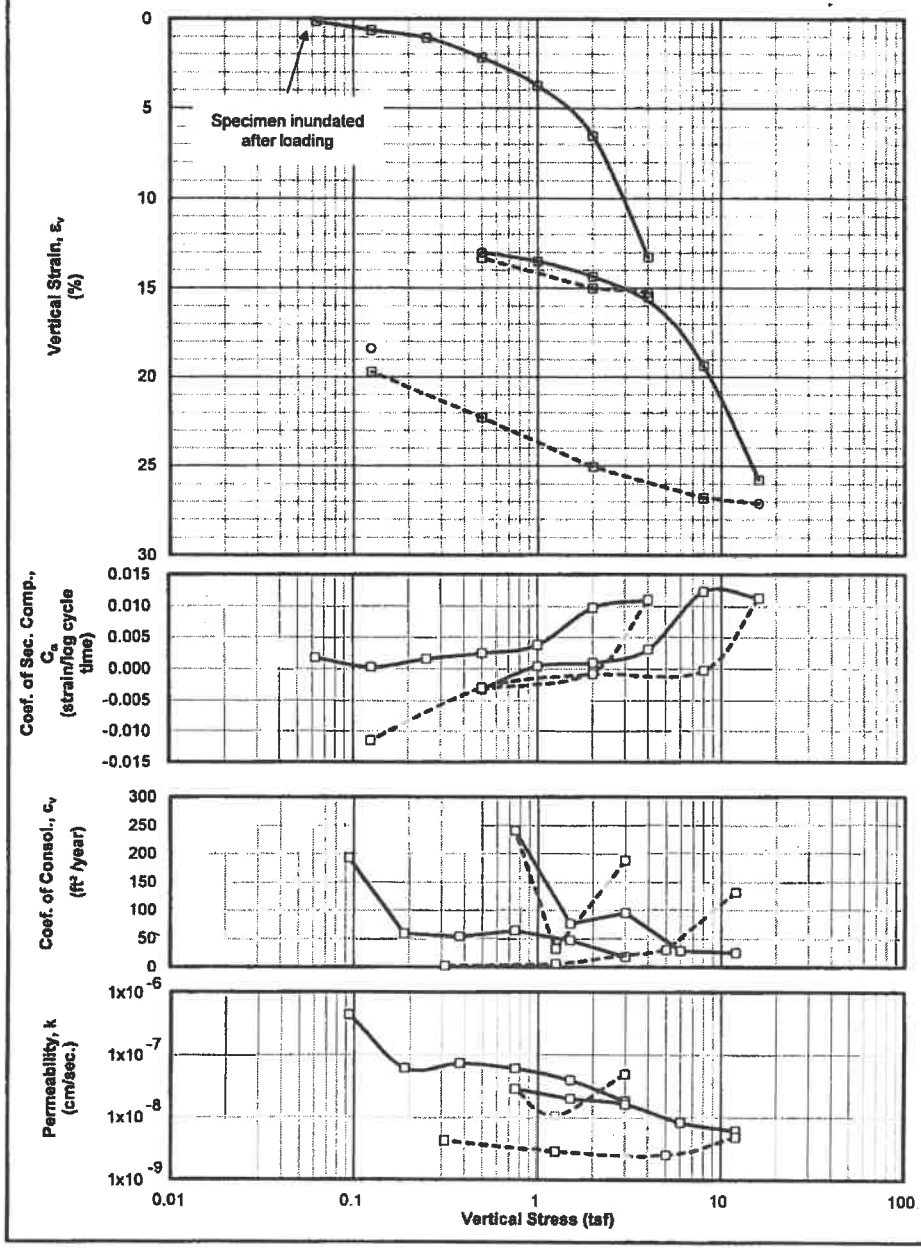
PROJECT:	DDC Term					
PROJECT NO.:	7753-13003	Initial height:	0.617 inch	Final height:	0.536 inch	
BORING:	B-1	Initial water content:	52.9 %	Final water content:	41.9 %	
SAMPLE:	U-2C	Initial dry density:	68.6 pcf	Final dry density:	79.0 pcf	
TEST:	C13071	Initial total density:	104.8 pcf	Final total density:	112.1 pcf	
DEPTH, feet:	21.3	Initial saturation:	98 %	Final saturation:	100 %	
BY:	TK/CMJ	Initial void ratio:	1.448	Final void ratio:	1.126	
TEST DATE:	3/5/2013			Final strain:	13.2 %	

EQUIPMENT:
Load Frame No.: 7
Ring Diameter: 2.5 inch

SPECIMEN DESCRIPTION: CH, gray fat clay; shell fragments, some organics noted

G	LL	PL	PI
2.69	56	26	30

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft²/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0009	0.138	1.445	0.080	1.446	64.10	0.0010	45.31	4.27E-08
2	0.125	0.0018	0.292	1.441	0.344	1.440	175.85	0.0003	40.53	1.31E-07
3	0.250	0.0047	0.757	1.430	0.955	1.425	254.57	0.0012	26.89	2.86E-07
4	0.500	0.0092	1.494	1.412	1.816	1.404	212.53	0.0020	33.91	1.89E-07
5	1.00	0.0179	2.901	1.377	3.432	1.364	124.06	0.0041	35.54	1.05E-07
6	2.00	0.0472	7.651	1.261	9.200	1.223	36.35	0.0147	21.05	5.21E-08
7	1.00	0.0557	9.029	1.227	8.931	1.230	403.81	-0.0003	72.57	1.68E-07
8	0.250	0.0510	8.269	1.246	7.988	1.253	92.65	-0.0021	98.70	2.83E-08
9	0.500	0.0508	8.230	1.247	8.308	1.245	174.50	0.0005	637.21	8.26E-09
10	1.00	0.0542	8.782	1.233	8.891	1.231	215.61	0.0007	90.49	7.19E-08
11	2.00	0.0595	9.643	1.212	10.199	1.199	226.99	0.0032	116.24	5.89E-08
12	4.00	0.0892	14.460	1.094	15.794	1.062	40.12	0.0129	41.51	2.92E-08
13	8.00	0.1294	20.977	0.935	22.681	0.893	44.82	0.0084	61.38	2.20E-08
14	4.00	0.1392	22.570	0.896	22.527	0.897	459.33	-0.0002	251.14	5.52E-08
15	1.00	0.1333	21.618	0.919	21.344	0.926	118.81	-0.0021	314.98	1.14E-08
16	0.250	0.1217	19.726	0.965	19.102	0.981	15.76	-0.0064	39.66	1.20E-08
17	0.063	0.0992	16.079	1.055	15.130	1.078	1.87	-0.0092	5.14	1.10E-08



SAMPLE INFORMATION

Boring:	B-2
Sample:	U-1D
Depth:	14.95 feet
Elevation:	
Type:	3-inch thin wall tube
Description:	CH, gray fat clay; shell fragments, some organics noted

LL = 70, PL = 30, PI = 40

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height:	0.61	inch
Diameter:	2.50	inch

Initial water content:	59.8	%
Initial total unit weight:	103.5	pcf
Initial dry unit weight:	64.8	pcf
Initial void ratio:	1.650	
Initial degree of saturation:	100	%
Final water content:	47.0	%
Final total unit weight:	110.1	pcf
Final dry unit weight:	74.9	pcf
Final void ratio:	1.292	
Final degree of saturation:	100	%

(assumed specific gravity = 2.75)

TEST SUMMARY

Construction Method:	Casagrande (Log)
Estimated preconsolidation stress (tsf):	2.0 (Range: 1.7 to 2.1)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.213
Compression Index (void ratio per log cycle stress):	0.565
Swell Ratio (strain per log cycle stress):	0.028
Swell Index (void ratio per log cycle stress):	0.074
Recompression Ratio (strain per log cycle stress):	0.025
Recompression Index (void ratio per log cycle stress):	0.066
Remarks:	

LEGEND: □ End of primary ○ End of Stage ——— Loading - - - - - - - Unloading

Test Date: 3/5/13 Tested By: TK/CMJ Checked By: GET

YU & Associates Project No. 12207	DDC Term Newtown Creek Nature Walk	ONE DIMENSIONAL CONSOLIDATION TEST Boring: B-2 Depth: 14.95 feet
TerraSense, LLC	Project No. 7753-13003	March 2013

PROJECT:	DDC Term
PROJECT NO.:	7753-13003
BORING:	B-2
SAMPLE:	U-1D
TEST:	C13072
DEPTH, feet:	14.95
BY:	TK/CMJ
TEST DATE:	3/5/2013

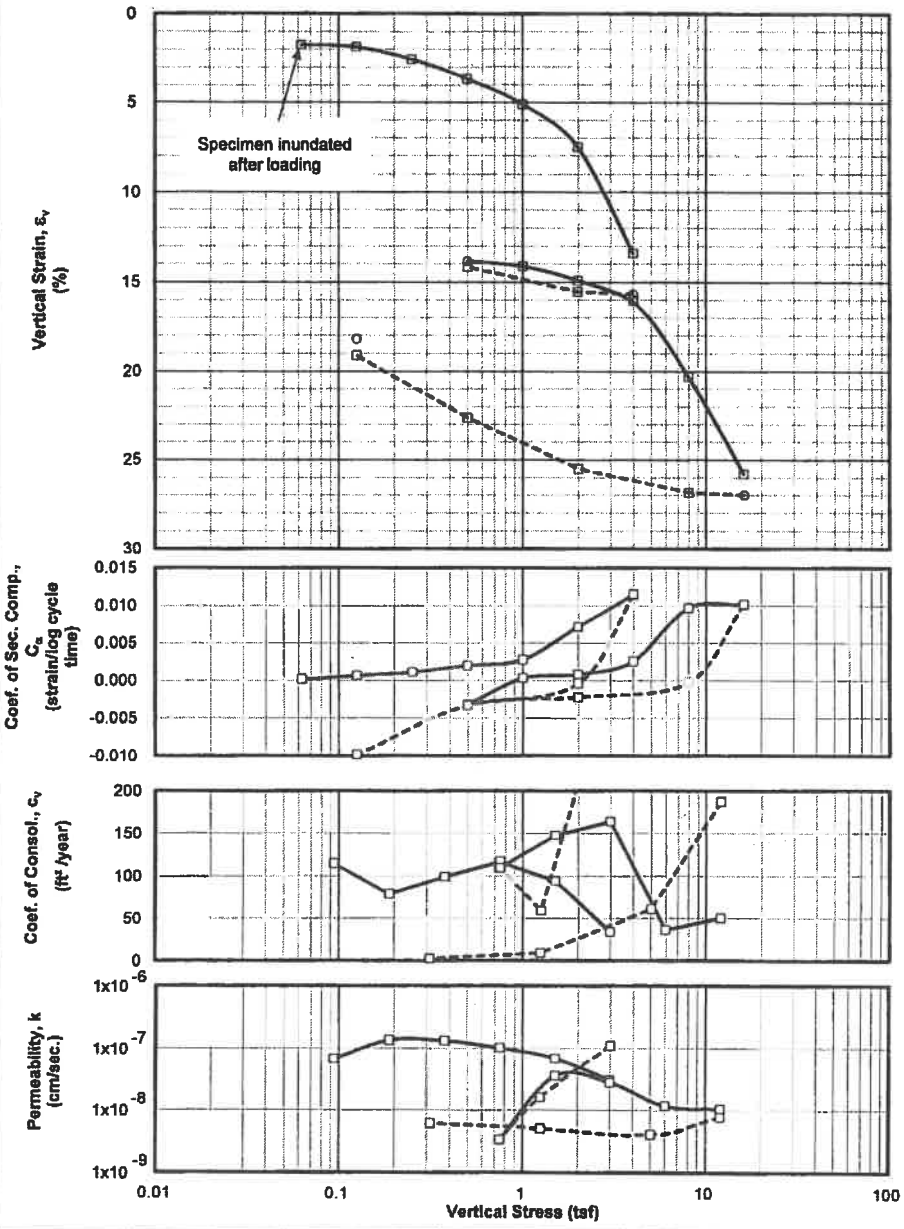
Initial height:	0.611 inch	Final height:	0.528 inch
Initial water content:	59.8 %	Final water content:	47.0 %
Initial dry density:	64.8 pcf	Final dry density:	74.9 pcf
Initial total density:	103.5 pcf	Final total density:	110.1 pcf
Initial saturation:	100 %	Final saturation:	100 %
Initial void ratio:	1.650	Final void ratio:	1.292
		Final strain:	13.5 %

EQUIPMENT:
Load Frame No.: 3
Ring Diameter: 2.5 inch

SPECIMEN DESCRIPTION: CH, gray fat clay; shell fragments, some organics noted

G	LL	PL	PI
2.75	70	30	40

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft^2/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0010	0.157	1.646	0.294	1.643	255.21	0.0017	39.83	1.93E-07
2	0.125	0.0039	0.635	1.634	0.629	1.634	192.20	0.0003	13.08	4.43E-07
3	0.250	0.0065	1.066	1.622	1.220	1.618	58.42	0.0016	28.96	6.09E-08
4	0.500	0.0134	2.198	1.592	2.465	1.585	52.86	0.0024	22.08	7.22E-08
5	1.00	0.0230	3.761	1.551	4.159	1.540	63.29	0.0037	32.00	5.97E-08
6	2.00	0.0398	6.523	1.477	7.566	1.450	46.35	0.0097	36.20	3.86E-08
7	4.00	0.0810	13.265	1.299	15.249	1.246	17.85	0.0109	29.66	1.82E-08
8	2.00	0.0917	15.017	1.252	14.928	1.255	187.86	-0.0006	114.18	4.96E-08
9	0.500	0.0814	13.320	1.297	12.996	1.306	31.32	-0.0033	88.40	1.07E-08
10	1.00	0.0825	13.513	1.292	13.565	1.291	240.11	0.0004	258.37	2.80E-08
11	2.00	0.0879	14.384	1.269	14.604	1.263	75.59	0.0009	114.81	1.99E-08
12	4.00	0.0948	15.521	1.239	15.942	1.228	94.24	0.0031	176.00	1.62E-08
13	8.00	0.1183	19.370	1.137	20.767	1.100	28.15	0.0122	103.92	8.17E-09
14	16.0	0.1575	25.791	0.967	27.093	0.932	24.98	0.0112	124.59	6.05E-09
15	8.00	0.1636	26.779	0.941	26.730	0.942	131.61	-0.0003	809.27	4.91E-09
16	2.00	0.1531	25.066	0.986	24.892	0.991	29.53	-0.0009	350.21	2.54E-09
17	0.500	0.1361	22.286	1.060	21.979	1.068	5.32	-0.0031	53.96	2.97E-09
18	0.125	0.1204	19.710	1.128	18.373	1.163	2.11	-0.0115	14.56	4.38E-09



SAMPLE INFORMATION

Boring:	B-3
Sample:	U-2D
Depth:	22.00 feet
Elevation:	
Type:	3-inch thin wall tube
Description:	CH, gray fat clay

LL = 58, PL = 26, PI = 32

SPECIMEN INFORMATION

(NOTE: Initial and final states refer to beginning and end of test)

Initial height:	0.61	inch
Diameter:	2.50	inch

Initial water content:	51.9	%
Initial total unit weight:	106.4	pcf
Initial dry unit weight:	70.0	pcf
Initial void ratio:	1.478	
Initial degree of saturation:	98	%
Final water content:	42.2	%
Final total unit weight:	113.6	pcf
Final dry unit weight:	79.9	pcf
Final void ratio:	1.173	
Final degree of saturation:	100	%

(assumed specific gravity = 2.78)

TEST SUMMARY

Construction Method:	Casagrande (Log)
Estimated preconsolidation stress (tsf):	2.1 (Range: 1.9 to 2.3)
Estimated in situ effective overburden stress (tsf):	
Compression Ratio (strain per log cycle stress):	0.229
Compression Index (void ratio per log cycle stress):	0.567
Swell Ratio (strain per log cycle stress):	0.022
Swell Index (void ratio per log cycle stress):	0.055
Recompression Ratio (strain per log cycle stress):	0.021
Recompression Index (void ratio per log cycle stress):	0.052
Remarks:	

LEGEND: □ End of primary ○ End of Stage ——— Loading - - - - - - - Unloading

Test Date: 3/5/13 Tested By: TK/CMJ Checked By: GET

YU & Associates Project No. 12207	DDC Term Newtown Creek Nature Walk	ONE DIMENSIONAL CONSOLIDATION TEST Boring: B-3 Depth: 22.00 feet
TerraSense, LLC	Project No. 7753-13003	March 2013

PROJECT:	DDC Term					
PROJECT NO.:	7753-13003	Initial height:	0.609 inch	Final height:	0.534 inch	
BORING:	B-3	Initial water content:	51.9 %	Final water content:	42.2 %	
SAMPLE:	U-2D	Initial dry density:	70.0 pcf	Final dry density:	79.9 pcf	
TEST:	C13073	Initial total density:	106.4 pcf	Final total density:	113.6 pcf	
DEPTH, feet:	22	Initial saturation:	98 %	Final saturation:	100 %	
BY:	TK/CMJ	Initial void ratio:	1.478	Final void ratio:	1.173	
TEST DATE:	3/5/2013			Final strain:	12.3 %	

EQUIPMENT:

Load Frame No.: 1

Ring Diameter: 2.5 inch

SPECIMEN DESCRIPTION: CH, gray fat clay

G	LL	PL	PI
2.78	58	26	32

Load No.	Load (tsf)	d_{100} (inch)	t_{100} Strain (%)	t_{100} Void Ratio (-)	Final Strain (%)	Final Void Ratio (-)	c_v (ft^2/year)	C_α (strain/logt)	Constrained Modulus (tsf)	Permeability (cm/sec)
1	0.063	0.0107	1.758	1.434	1.725	1.435	384.87	0.0002	3.55	3.27E-06
2	0.125	0.0114	1.879	1.431	1.944	1.430	114.78	0.0006	51.87	6.68E-08
3	0.250	0.0157	2.585	1.414	2.700	1.411	78.40	0.0011	17.69	1.34E-07
4	0.500	0.0224	3.675	1.387	3.922	1.381	98.87	0.0020	22.94	1.30E-07
5	1.00	0.0311	5.103	1.352	5.530	1.341	116.67	0.0028	35.02	1.00E-07
6	2.00	0.0456	7.500	1.292	8.518	1.267	93.86	0.0071	41.72	6.79E-08
7	4.00	0.0814	13.380	1.146	15.664	1.090	33.91	0.0114	34.01	3.01E-08
8	2.00	0.0945	15.531	1.093	15.416	1.096	338.28	-0.0004	92.98	1.10E-07
9	0.500	0.0863	14.181	1.127	13.852	1.135	58.87	-0.0032	111.08	1.60E-08
10	1.00	0.0860	14.130	1.128	14.163	1.127	109.52	0.0003	980.71	3.37E-09
11	2.00	0.0908	14.917	1.108	15.048	1.105	147.25	0.0008	127.06	3.50E-08
12	4.00	0.0976	16.032	1.081	16.476	1.070	163.53	0.0026	179.27	2.75E-08
13	8.00	0.1234	20.279	0.975	22.070	0.931	36.27	0.0097	94.19	1.16E-08
14	16.0	0.1568	25.765	0.840	26.981	0.809	50.17	0.0102	145.82	1.04E-08
15	8.00	0.1634	26.848	0.813	26.799	0.814	187.02	-0.0002	738.72	7.64E-09
16	2.00	0.1552	25.498	0.846	25.268	0.852	60.62	-0.0022	444.33	4.12E-09
17	0.500	0.1378	22.636	0.917	22.241	0.927	8.95	-0.0033	52.41	5.15E-09
18	0.125	0.1163	19.117	1.004	18.196	1.027	2.15	-0.0099	10.66	6.09E-09

APPENDIX 2

REMEDIAL ACTION PLAN

Newtown Creek Nature Walk Extension Phase 3
329 Greenpoint Avenue
Brooklyn, New York

DDC PROJECT NO. NC-61A

WORK ORDER NO. 12501-LIRO-3-11330

CONTRACT REGISTRATION NO. 20151405569

Prepared for:

NYC DDC Department of Design and Construction

Office of Environmental and Geotechnical Services

30-30 Thomson Avenue, Third Floor

Long Island City, New York 11101

Prepared by:

LiRo Engineers, Inc.

703 Lorimer Street

Brooklyn, New York 11211

Project No. 15-008-02651

March 15, 2017

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Figures

Figure 1 Topographic Site Location Map
Figure 2 Site Plan

Appendices

Appendix A Construction Health and Safety Plan (CHASP)
Appendix B Phase II Environmental Subsurface Investigation Report – Included on Attached CD

1.0 INTRODUCTION

LiRo Engineers, Inc. (LiRo) has prepared this Remedial Action Plan (RAP) on behalf of the New York City Department of Design and Construction (DDC) of the NC-61A Site located at 329 Greenpoint Avenue, (the "Site"). The Site is located in the Greenpoint neighborhood of Brooklyn, New York. The general scope of work for this project is to construct an extension to the existing Newtown Creek Nature Walk which would provide the public expanded opportunities to connect with the waterfront site's natural and cultural history, consisted of a gated and fenced waterfront park with car parking. The proposed Nature Walk Site has been subject to City Environmental Quality Review (CEQR) and a CEQR negative declaration was issued on February 17, 2016.

The Site consists of a vacant trapezoid-shaped lot, approximately 430 feet and 360 feet long by 70 feet wide (approximately 0.7-acre area), and is bounded by the intersection of North Henry Street and Kingsland Avenue to the east, Whale Creek to the west, Newtown Creek Wastewater Treatment Plant to the south, and the former Department of Sanitation (DSNY) to the north. The Site is situated in an area characterized by predominantly industrial uses. The location of the Site is shown on Figure 1.

In October 2016, LiRo conducted a Phase II Environmental Subsurface Investigation (ESI) to assess potential environmental concerns that may impact the proposed construction activities at the Site.

1.1 Site History and Land Use

Based on historical aerial photographs of the Site obtained through NYC Maps, the Site has been utilized as a portion of the Newtown Creek Wastewater Treatment Plant from approximately the mid to late 1900's until the recent past. The Site was also historically identified as Kingsland Avenue. The Site does not appear to have included any structures based on historical information and appears to have been utilized for equipment storage.

A City Map Change is required for the demapping of Kingsland Avenue. Associated with the City Map Change is the establishment of a turnaround area within North Henry Street that would become an extension of the northern limits of public street Kingsland Avenue.

1.2 Anticipated Construction Activities

The work addressed by this RAP includes the construction of the Newtown Creek Nature Walk Extension Phase 3. The proposed development includes a waterfront park consisting of boundary walls and fences with lockable pedestrian and vehicular gateways, parking, a shade structure, fixed seating and tables, planted areas, lighting, and signage. Nature Walk Phase 3 design also includes provisions to maintain access to the New York City Department of Environmental Protection (NYCDEP) Floatables Collection Facility that presently exist along the eastern side of Whale Creek Canal. The intent for Phase 3 area is to extend design elements of the completed portion (Phase 1) of the Nature Walk to the Phase 3 area to provide a pedestrian link around the Wastewater Treatment Plant perimeter and to provide park-like amenities to the surrounding community. The area will have a fenced boundary that prevents access to the remainder of the park property. No structures, such as buildings or kiosks, are currently proposed for the Site. A Site Plan is shown on Figure 2.

1.3 Purpose and Scope of Remedial Action Plan

Activities included in the scope of this RAP include excavation and removal of contaminated soil to the extent required to construct the park and clean cover/paving cap to final design grade(s). The depth of excavation will depend upon the final design; however, it is anticipated to be 2 to 12 feet below grade (ftbg), and mostly at 3 ftbg. Proposed construction activities will include the placement of surface materials as required on top of a minimum of 2 feet of clean fill over the entire project area and will act as a remedial measure for any environmental concerns.

A Construction Health and Safety Plan (CHASP) which details the worker protection and community air monitoring procedures to be implemented during the construction work is appended to this RAP.

2.0 SUMMARY OF PREVIOUS INVESTIGATION

LiRo prepared a Phase II Environmental Subsurface Investigation (Phase II ESI) report for the Site, dated December 2, 2016. This study included the collection of soil and groundwater samples from borings located on-site. The purpose of this study was to obtain preliminary data relative to environmental conditions at the Site prior to the development of a RAP as part of the overall redevelopment of the Site.

The Phase II ESI included the following activities:

- The advancement of one (1) boring (SB-01) to a terminal depth of approximately 6 feet below grade (ftbg), a second boring to a terminal depth of approximately 15 ftbg (SB-02), and a third boring to a terminal depth of approximately 5 ftbg (SB-03) due to refusal;
- Field screening of soil samples, including photo-ionization detector (PID) readings and visual and olfactory indicators of contamination (staining, odors);
- The collection of four (4) grab soil samples which were analyzed for the following parameters: (1) United States Environmental Protection Agency (USEPA) Target Compound List (TCL) volatile organic compounds (VOCs); (2) USEPA TCL semi-volatile organic compounds (SVOCs); (3) TCL polychlorinated biphenyls (PCBs); (4) USEPA pesticides; and, (5) USEPA Target Analyte List (TAL) metals;
- The collection of three (3) composite soil samples which were analyzed for the following parameters: (1) Total Petroleum Hydrocarbon Diesel Range Organics/Gasoline Range Organics (TPHC DRO/GRO); (2) Resource Conservation and Recovery Act (RCRA) Characteristics; and, (3) Toxicity Characteristic Leaching Procedure (TCLP) RCRA Metals;
- The installation of one (1) temporary well point (TWP) within soil boring SB-02, the collection of one (1) groundwater sample from the TWP, and the laboratory analyses of this sample for the following parameters: (1) USEPA TCL VOCs; (2) USEPA TCL SVOCs; (3) TCL PCBs; (4) USEPA pesticides; (5) USEPA TAL metals (filtered and unfiltered); and, (6) NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (NYCDEP Sewer Discharge Criteria);
- The soil and groundwater samples collected as part of this Phase II ESI were collected to comply with the NYCDEP CEQR protocols;
- Soil and groundwater Quality Control/Quality Assurance (QA/QC) samples were also collected to comply with the NYCDEP CEQR protocols and submitted for analysis; and,
- The preparation of the Phase II ESI report, which includes tables summarizing the laboratory analytical results and figures depicting boring locations, significant site features and, if applicable, contamination occurrence and distribution.

In order to evaluate the subsurface soil and groundwater quality, laboratory analytical results were compared with the regulatory standards identified in (1) New York State Department of Environmental Conservation (NYSDEC) Subpart 375-6: Remedial Program Unrestricted and Restricted Use (Track 1 and Track 2) SCOs; (2) NYSDEC CP-51 SCLs which include Supplemental Soil Cleanup Objectives (SSCOs) to NYSDEC Subpart 375-6 and SCLs for gasoline/fuel oil contaminated soil; and/or, (3) Toxicity Characteristic Regulatory Levels for Hazardous Waste published in RCRA and 6 New York Codes, Rules and Regulations (NYCRR) Part 371. In order to evaluate the groundwater quality, the laboratory analytical results for the groundwater sample was compared to the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS

1.1.1) Ambient Water Quality Standards (Class GA groundwater) and Guidance Values (AWQSGVs) and Groundwater Effluent Limitations and the NYCDEP Sewer Discharge Criteria.

The subsurface soils encountered during this Phase II ESI consisted predominantly of dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg in SB-02. The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13-15 ftbg. Groundwater was encountered within two (2) of the borings at depths ranging from 4 (in SB-03) to 9 ftbg (SB-02). Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.

Field screening (i.e., PID readings and visual and olfactory indicators) did not identify impacted soils at the Site.

VOCs, including acetone, bromochloromethane, carbon disulfide, chloroform, ethylbenzene, isopropyl benzene, methylene chloride, o-xylene, tetrachloroethene, trichloroethene, and/or xylene (mixed), were detected in all four (4) grab samples collected at concentrations below the Unrestricted Use (Track 1) SCO, Restricted Use (Track 2) SCOs, and CP-51 SCLs. Acetone and methylene chloride are common laboratory cross contaminants and are most likely not representative of subsurface conditions. SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and/or indeno(1,2,3-cd)pyrene, were detected in all four (4) grab samples collected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs. The detected SVOCs may be attributed to: (a) residuals from isolated releases in the area of the Site; and/or, (b) the presence of historic fill material placed at the Site. TAL metals, including arsenic, chromium (total), copper, iron, lead, mercury, nickel, selenium, and/or zinc, were detected in all four (4) grab samples collected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs. The reported concentrations are likely attributed to background levels and/or historic fill material placed at the Site. One (1) pesticide, 4,4'-DDE, was detected in one (1) of the four (4) grab samples collected (SB-03-3.5-4) at a concentration exceeding the corresponding Unrestricted Use (Track 1) SCO. One (1) PCB, Aroclor 1260, was detected in two (2) of the four (4) grab samples collected (SB-01-5.5-6 and SB-02-0-2) below the corresponding Unrestricted Use (Track 1) SCO and Restricted Use (Track 2) SCO.

Ignitability (flash point), reactivity (cyanide and sulfide), and corrosivity (pH) were within the acceptable RCRA ranges in all three (3) composite samples collected. TCLP RCRA metals were not detected at concentrations exceeding RCRA limits in the three (3) waste characterization soil samples collected. TPHC-DRO were detected at concentrations ranging from 35 to 81 milligrams per kilograms (mg/kg) in all three (3) samples (SB-01-COMP, SB-02-COMP, and SB-03-COMP). TPHC-GRO were not detected in any of the three (3) composite samples collected. There are no regulatory standards for TPHC-DRO and TPHC-GRO. Analytical results will need to be compared to levels acceptable by the chosen receiving facility to determine appropriate waste characterization prior to off-site disposal.

The one (1) groundwater sample (TWP-02) was analyzed for the parameters required by the NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (Daily Limit). All parameters were within NYCDEP Sewer Discharge Criteria.

One (1) VOC, carbon disulfide, was detected in the groundwater sample collected at a concentration below the NYCDEP Sewer Discharge Criteria and/or TOGS 1.1.1 AWQSGV. One (1) SVOC, dimethyl phthalate, was detected in the groundwater sample collected at a concentration below the NYCDEP Sewer Discharge Criteria and/or TOGS 1.1.1 AWQSGV. TAL metals (unfiltered), including arsenic, iron, lead, magnesium, manganese, and sodium, were detected in the groundwater sample collected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. TAL metals (filtered/dissolved), including arsenic, iron, magnesium, manganese, and sodium, were also detected in the groundwater sample collected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. Pesticides and PCBs were not detected in the groundwater sample collected.

For the Site to be suitable for proposed development, the following measures were recommended within the Phase II SCI report.

- Based on the SVOCs, metals, pesticides, and TPHC DRO contamination identified during the investigation, it was recommended that the Contract documents identify provisions and a contingency for managing, handling, transporting and disposing of such soils. The Contractor should be required to submit a Material Handling Plan to identify the specific protocol and procedures that will be employed to manage the waste in accordance with applicable regulations.
- It is expected that after the proposed Nature Walk Phase 3 is constructed, there will be no exposed soil left at the Site. It was recommended that the landscaped areas incorporated into the development of the Site will include a minimum 24 inch-thick clean soil layer or equivalent be placed over soils.
- Due to the presence of SVOCs, metals, pesticides, and TPHC DRO in the subsurface soil at the Site, dust control procedures were recommended during excavation activities to minimize the creation and dispersion of fugitive airborne dust. The Contractor may implement dust control measures to minimize potential airborne contaminants released as a direct result of construction activities. A Community Air Monitoring Plan (CAMP) should be developed in accordance with NYSDEC DER-10 Regulations. The CAMP requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is intended to provide a measure of protection for the downwind community from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Specific requirements shall be reviewed for each situation in consultation with NYSDOH to ensure proper applicability.
- Dewatering may be necessary during construction activities in the Site. Based on the results of laboratory analyses for NYCDEP sewer discharge criteria, groundwater does not require pre-treatment prior to discharge to sanitary or combined sewers; however, the contractor may be required to obtain a NYCDEP sewer discharge permit if dewatering is necessary.

- If discharge into storm sewers is required during dewatering, it may be done under the appropriate NYSDEC State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis may be required to satisfy NYSDEC requirements prior to discharge into storm sewers.
- Before beginning any excavation activity, the contractor shall submit a Site-specific health and safety plan (HASP) that will meet the requirements set forth by the Occupational, Safety and Health Administration (OSHA), the New York State Department of Health (NYSDOH) and any other applicable regulations. The HASP should identify the possible locations and risks associated with the potential contaminants that may be encountered, and the administrative and engineering controls that will be utilized to mitigate concerns (i.e., dust control procedures for soils containing SVOCs, metals, pesticides, and TPHC DRO).

3.0 SITE CONTAMINATION

The site conditions and contamination at the Site are discussed in the following subsections.

3.1 Site Geology and Hydrology

The subsurface soils encountered during the Phase II ESI consisted predominantly of dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg (the maximum boring depth). The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13 to 15 ftbg. Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.

Based on the Phase II ESI, groundwater was encountered within two (2) of the borings at depths ranging from 4 (SB-03) to 9 ftbg (SB-02). The nearest surface water body is Whale Creek which is located west adjacent to the Site and Newtown Creek to the north. Based on elevation and proximity of Whale Creek and Newtown Creek, groundwater flow direction is anticipated to be to the west-northwest. Generally, groundwater flow follows topographic elevation of the area with flow migrating from higher to lower elevations. Groundwater flow direction may also vary due to tidal influence, seasonal fluctuations in precipitation, local usage demands, variation within the local subsurface lithology, underground structures, or local dewatering operations.

3.2 Nature of Contamination

Tables 1 through 6 present a summary of the contaminants found during the Phase II ESI. The results are briefly described below. The full Phase II Report is appended to this RAP.

Soils

- Field screening (i.e., PID readings and visual and olfactory observations) did not identify impacted soils within the Site.
- Subsurface soils contain elevated concentrations of SVOCs, metals, pesticides, and TPHC DRO that exceed the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).

Groundwater

- Concentrations of metals (arsenic, iron, lead, magnesium, manganese, and sodium) were detected at concentrations above the State Groundwater quality standards and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).
- One VOC (carbon disulfide) and one SVOC (dimethyl phthalate) were detected at concentrations below the NYCDEP Sewer Discharge Criteria and TOGS 1.1.1 AWQSGV.

4.0 REGULATORY CORRESPONDENCE

The goal for all parties involved in the Site redevelopment is to ensure that the contamination poses no risk to public health or the environment.

If necessary, Section 5 of this RAP and the CHASP may be amended to address any site-specific requirements brought forth by NYCDEP upon completion of their review of these documents.

5.0 PROPOSED REMEDIAL ACTIONS

The Site remediation tasks and objectives are the mitigation of human contact with soils impacted by SVOCs, metals, pesticides, and TPHC DRO. Remedial measures described herein will be performed in accordance with applicable Federal, State and Local regulations, and the attached CHASP.

At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by SVOCs, metals, pesticides, and TPHC DRO impacts at the Site through the proper application of scientific and engineering principles. The remediation goals for this Site are to reduce to the extent practicable the presence of SVOCs, metals, pesticides, and TPHC DRO contaminants in the soil as a potential threat by direct contact to human health.

The proposed remedial actions are the excavation and disposal of contaminated soil as required to facilitate construction and the placement of surface materials as required over clean cover soil to prevent exposure to contaminated soil.

5.1 Remedial Actions

Remedial activities and controls to be implemented in compliance with City requirements and in conjunction with Subject Site development are: impacted soil removal; health and safety considerations; dewatering; the importation of clean fill material; clean soil cover for the entire site areas; and, closure report. Soil remediation will consist of removal and disposal of contaminated soil to the extent necessary to facilitate construction.

5.1.1 Impacted Soil Removal

Excavations will be performed to meet Site grade(s) and to install proposed utilities and features. The excavated soil will be classified for waste characterization parameters according to disposal facility requirements, transported under appropriate regulatory permits, and disposed of or recycled at a licensed facility permitted to accept the soil. All soil removal operations will be performed in accordance with NYSDEC solid waste regulations. The final remedial action will be the removal of impacted soil to the extent practical considering the proposed new construction. Soil sample analysis completed as part of the previous Phase II SCI investigation determined that the Subject Site soils are contaminated; however, additional characterization may be required as per requirements of the selected disposal facility. Limited re-use of soil may be permitted providing the soil poses no future potential exposure risk.

A Community Air Monitoring Plan (CAMP) should be implemented in accordance with NYSDEC DER-10 Regulations during remedial activities. The CAMP will include real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress. The CAMP is intended to provide a measure of protection for the downwind community from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Specific requirements shall be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. The CAMP is included within the attached CHASP.

5.1.2 Importation of Clean Fill Material

Clean fill for this Project should be certified through laboratory analyses for VOCs, SVOCs, TAL Metals, PCBs, and pesticides at a sample frequency of 1 sample per 250 cubic yards and/or as per the Department of Parks and Recreation soil sampling requirements. The results will be compared to 6 NYCRR Part 375 Restricted Residential Use Criteria and will be provided to the NYCDEP prior to import to the Site. For all landscaped areas or exposed soil areas, a minimum of two (2) feet of clean fill will be placed. The imported fill material must also comply with the anticipated Contract Document requirements for suitability (e.g., gradation, organic content, pH, etc.).

Prior to backfilling, the top of the residual soil/fill will be defined by placing a demarcation layer. The demarcation layer should consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer.

5.1.3 Dewatering

Should dewatering become necessary during construction, the contractor should be required to obtain a NYCDEP sewer discharge permit. If discharge into surface waters is required during dewatering, it may be done under the appropriate NYSDEC State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis may be required to satisfy NYCDEP or NYSDEC requirements prior to discharge into sewers or surface waters. Groundwater collected through dewatering operations during construction will be treated on-site, if necessary, prior to discharge.

Alternatively, if only limited dewatering is required during construction, groundwater may be containerized, characterized, and properly disposed of at an off-site location.

6.0 DOCUMENTATION AND ENGINEERING CLOSURE REPORT

Upon completion of the Site remediation work, the City's environmental consultant who will perform the environmental monitoring activities, will prepare a Professional Engineer-certified Closure Report that will describe the remedial work performed, clean imported soil analytical report(s), waste disposal records, sampling, and laboratory reports. In addition, the report will describe the justification for any deviations from the approved RAP and any unanticipated findings.

The Engineering Closure Report will summarize all environmental activities performed during construction including the following.

- Air Monitoring Data and daily environmental monitoring activities
- Soil Testing, Handling, and Disposition
- Imported Fill Testing and Disposition
- Identification, Testing, Handling, Transport and Disposal of Contaminated Soils and Groundwater

6.1 Documentation and Contractors Reports

Contractors shall provide the Resident Engineer's on-site representative a daily contractor's report that details the remedial actions or construction activities that have taken place that day.

Other documentation that is to be submitted to the Resident Engineer on a daily or weekly basis may include the following:

- Waste Characterization Testing Procedures
- All laboratory data with chain of custody forms
- All air monitoring results
- All waste manifests
- All non-hazardous and hazardous waste manifests, bills or lading
- All soil or backfill weight tickets
- Volume of water generated and/or disposed of
- Any personnel air monitoring data
- Any violations or notice of deficiencies
- Any other regulatory notifications or documents
- Any communications with Regulators, News Media, or the Public

Tables

Table 1	Summary of TCL VOCs Detected in Soil
Table 2	Summary of TCL SVOCs Detected in Soil
Table 3	Summary of TAL Metals Detected in Soil
Table 4	Summary of Pesticides Detected in Soil
Table 5	Summary of TAL Metals Detected in Groundwater
Table 6	Summary of TAL Metals (Dissolved) Detected in Groundwater

Table 1. Summary of Target Compound List (TCL)
Volatile Organic Compounds (VOCs) Detected in Soil

TCL VOC	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs) / Supplemental Soil Cleanup Objectives (SSCOs) - Residential	Sample ID, Date Collect, and Depth (ft bgs)					
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2RE	SB-02-8.5-9RE	SB-03-3.5-4	Trip Blank
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016	NA
				5.5-6	5.5-6	0-2	8.5-9	3.5-4	NA
Acetone	50	100,000	NS	ND	ND	12.3 J	ND	ND	ND
Bromochloromethane	NS	NS	NS	1.3 J	ND	ND	ND	ND	ND
Carbon Disulfide	NS	NS	100,000	ND	ND	1.1 J	ND	ND	ND
Chloroform	370	10,000	NS	ND	1.7 J	ND	ND	ND	ND
Ethylbenzene	1,000	30,000	NS	ND	ND	ND	ND	2.5 J	ND
Isopropylbenzene	NS	NS	100,000	ND	ND	ND	ND	1.6 J	ND
Methylene chloride	50	51,000	NS	3.1 J	6.9	4.7 J	4.9 J	7.2	ND
o-Xylene	NS	NS	NS	ND	ND	ND	ND	7.1	ND
Tetrachloroethene	1,300	5,500	NS	ND	ND	ND	ND	210 JD	ND
Trichloroethene	470	10,000	NS	ND	ND	ND	ND	2.9 J	ND
Xylene (Mixed)	260	100,000	260	ND	ND	ND	ND	9.9 J	ND
Total VOCs	NS	NS	NS	4	9	18	5	241	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
NS = No Standard
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
J = Compound detected below the quantitation limit
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 SCLs = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - Soil Cleanup Levels for Gasoline Contaminated Soils, Table 3 - Soil Cleanup Levels for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table 2. Summary of Target Compound List (TCL)
Semi-Volatile Organic Compounds (SVOCs) Detected in Soil

TCL SVOC	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collect, and Depth (ft bgs)				
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9RE	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
2-Methylnaphthalene	NS	NS	410	ND	ND	ND	140 J	ND
Acenaphthene	20,000	100,000	20,000	ND	960 J	ND	340 J	ND
Acenaphthylene	100,000	100,000	100,000	ND	ND	ND	95.5 J	ND
Anthracene	100,000	100,000	100,000	820 J	2,100 J	ND	540	ND
Benzo(a)anthracene	1,000	1,000	1,000	***2,000***	***3,800 J***	***1,800 J***	***1,700***	ND
Benzo(a)pyrene	1,000	1,000	1,000	***1,600 J***	***2,800 J***	***1,400 J***	***1,200***	ND
Benzo(b)fluoranthene	1,000	1,000	1,000	***1,700 J***	***2,900 J***	***1,300 J***	***1,600***	ND
Benzo(g,h,i)perylene	100,000	100,000	100,000	850 J	1,700 J	1,100 J	770	ND
Benzo(k)fluoranthene	800	1,000	800	**890 J**	***1,500 J***	ND	410	ND
Carbazole	NS	NS	NS	ND	ND	ND	170 J	ND
Chrysene	1,000	1,000	1,000	***1,800 J***	***3,200 J***	***1,500 J***	***1,300***	ND
Dibenz[a,h]anthracene	330	330	330	ND	ND	ND	230 J	ND
Dibenzofuran	NS	NS	NS	ND	870 J	ND	210 J	ND
Dimethylphthalate	NS	NS	100,000	520 J	ND	ND	830	ND
Flouranthene	100,000	100,000	100,000	3,400	7,300	2,700 J	2,800	1,200 J
Fluorene	30,000	100,000	30,000	ND	1,300 J	ND	290 J	ND
Indeno(1,2,3-cd)pyrene	500	500	500	***900 J***	***1,800 J***	***1,200 J***	***620***	ND
Napthalene	12,000	100,000	12,000	ND	ND	ND	300 J	ND
Phenanthrene	100,000	100,000	100,000	3,400	9,200	2,800 J	2,800	1,400 J
Pyrene	100,000	100,000	100,000	3,100	8,300	3,100 J	2,300	1,200 J
Total SVOCs	NS	NS	NS	20,980	47,730	16,900	18,646	3,800

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
J = Compound detected below the quantitation limit
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table 3. Summary of Target Analyte List (TAL) Metals Detected in Soil

Target Analyte List Metal	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collected, and Depth (ft bgs)				
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
Aluminum	NS	NS	NS	5,310	5,060	5,660	7,140	8,300
Antimony	NS	NS	NS	7.74	30.4	1.45 J	1.02 J	ND
Arsenic	13	16	NS	*16.6*	*18.2*	14.7	13.3	4.53
Barium	350	350	NS	184	202	89.4	181	83.5
Beryllium	7.2	14	NS	0.259 J	0.27 J	0.4	0.33	0.351
Cadmium	2.5	2.5	NS	0.254 J	0.343	0.435	1.67	ND
Calcium	NS	NS	NS	9,100	8,080	26,700	9,900	32,800
Chromium (total)	30	36	NS	21.6	19.2	17.7	*182*	19.7
Cobalt	NS	NS	30	9.04	7.28	5.93	10.2	7.36
Copper	50	270	NS	247	266	*386*	129	35.4
Iron	NS	NS	2,000	**27,300**	**30,900**	**16,100**	**25,900**	**15,900**
Lead	63	400	NS	*572*	*549*	224	388	83.1
Magnesium	NS	NS	NS	1,710	1,340	4,130	2,630	5,840
Manganese	1,600	2,000	NS	307	293	168	215	219
Mercury	0.18	0.81	NS	0.733	0.681	0.288	0.567	0.237
Nickel	30	140	NS	20.4	20	17.7	64.8	22
Potassium	NS	NS	NS	675	611	848	1,140	1,220
Selenium	3.9	36	NS	7.43	8.65	1.85	6.62	0.857 J
Sodium	NS	NS	NS	354	330	196	425	348
Thallium	NS	NS	NS	0.628 J	0.726 J	ND	0.375 J	ND
Vanadium	NS	NS	100	23.1	20.6	22.7	25.1	41.3
Zinc	109	2,200	NS	322	344	273	472	107

Notes:
All concentrations are in parts per million (ppm or mg/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
J = Estimated value
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table 4. Summary of Pesticides Detected in Soil

Pesticides	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collected, and Depth (ft bgs)				
				SB-01-5.5-6RE	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
4,4'-DDE	3.3	1,800	NS	ND	ND	ND	ND	21.4
Chlordane (alpha)	94	910	NS	ND	ND	ND	ND	6.7
Gamma-BHC	NS	NS	NS	ND	3.8	ND	ND	ND
Total Pesticides	NS	NS	NS	ND	4	ND	ND	28

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table 5. Summary of Target Analyte List (TAL) Metals Detected in Groundwater

Target Analyte List Metal[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02	TWP-02-DUP	Equipment Blank
			10/25/2016	10/25/2016	10/25/2016
Aluminum	NS	NS	1,770 N	1,770 N	ND
Arsenic	NS	25	**67 N**	**68.6 N**	ND
Barium	NS	1,000	234 N	234 N	ND
Calcium Metal	NS	NS	174,000	178,000	ND
Chromium	NS	50	13	7.87	ND
Copper	NS	200	8.99 J	7.68 J	ND
Iron	NS	300	**2,780 N**	**2,870 N**	ND
Lead	NS	25	**33.6**	**36.4**	ND
Magnesium	NS	35,000	**183,000**	**184,000**	ND
Manganese	NS	300	**354 N**	**376 N**	ND
Mercury	NS	0.7	0.413	0.292	ND
Nickel	NS	100	8.82 J	6.76 J	ND
Potassium	NS	NS	99,700	102,000	39.3 J
Sodium	NS	20,000	**1,070,000**	**932,000**	635 J
Vanadium	NS	NS	5.65 J	5.79 J	ND
Zinc	NS	2,000	21.1	21.3	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
N = Presumative evidence of a compound
J = Compound detected below the quantitation limit
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table 6. Summary of Target Analyte List (TAL) Metals (Dissolved) Detected in Groundwater

Target Analyte List Metal[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect	
			TWP-02	TWP-02-DUP
			10/25/2016	10/25/2016
Aluminum	NS	NS	88 N	90.3 N
Arsenic	NS	25	**87.2 N**	**82.8 N**
Barium	NS	1,000	254 N	246 N
Calcium Metal	NS	NS	194,000	187,000
Chromium	NS	50	2.63 J	7.28
Copper	NS	200	3.75 J	4.02 J
Iron	NS	300	**1,740 N**	**1,710 N**
Lead	NS	25	6.39	6.7
Magnesium	NS	35,000	**205,000**	**198,000**
Manganese	NS	300	**374 N**	**343 N**
Nickel	NS	100	4.41 J	6.5 J
Potassium	NS	NS	115,000	110,000
Sodium	NS	20,000	**961,000**	**929,000**
Vanadium	NS	NS	5.02 J	ND
Zinc	NS	2,000	10.8 J	11.9 J

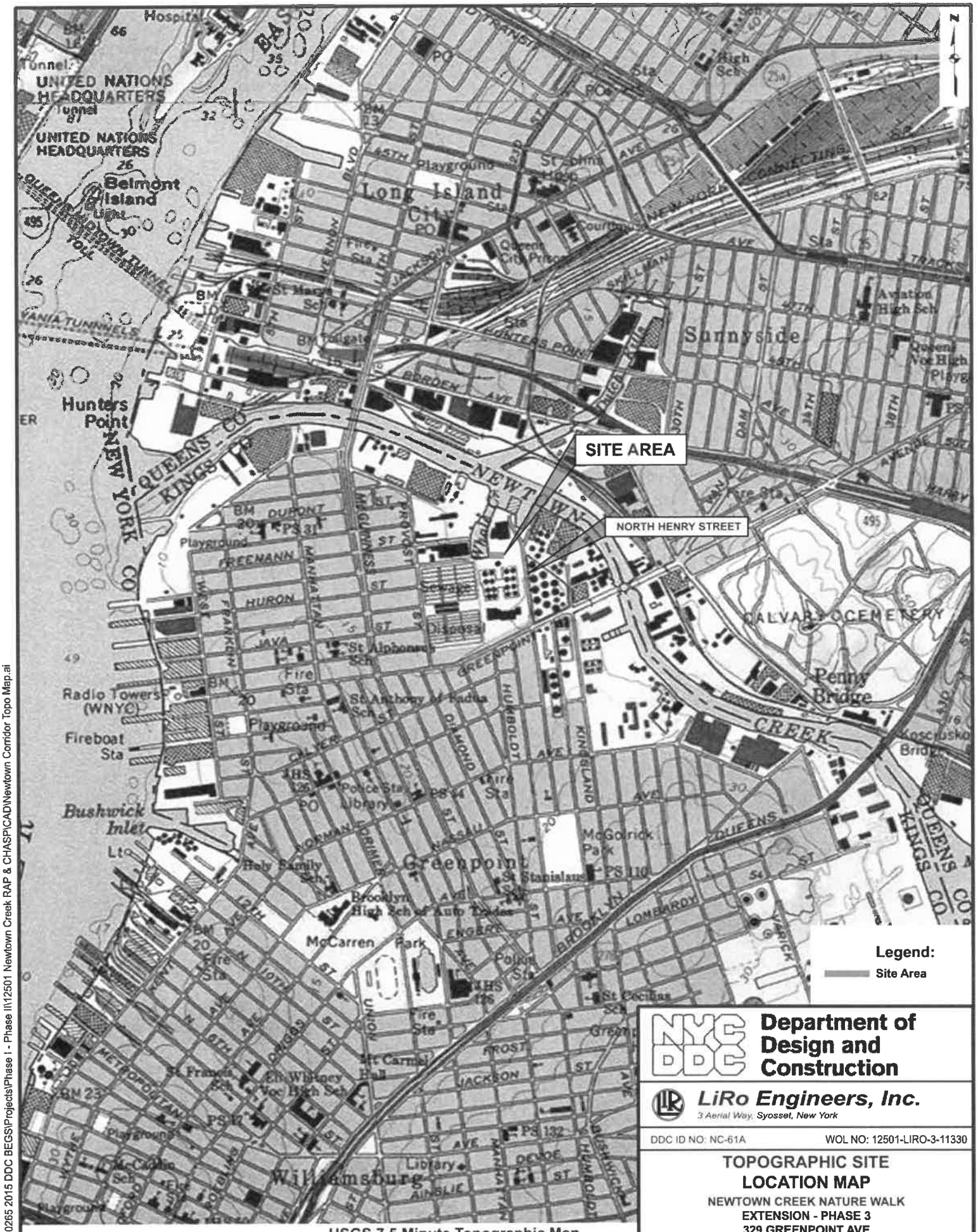
Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
N = Presumative evidence of a compound
J = Compound detected below the quantitation limit
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Figures

Figure 1 Topographic Site Location Map
Figure 2 Site Plan



Department of Design and Construction

LiRo Engineers, Inc.
3 Aerial Way, Syosset, New York

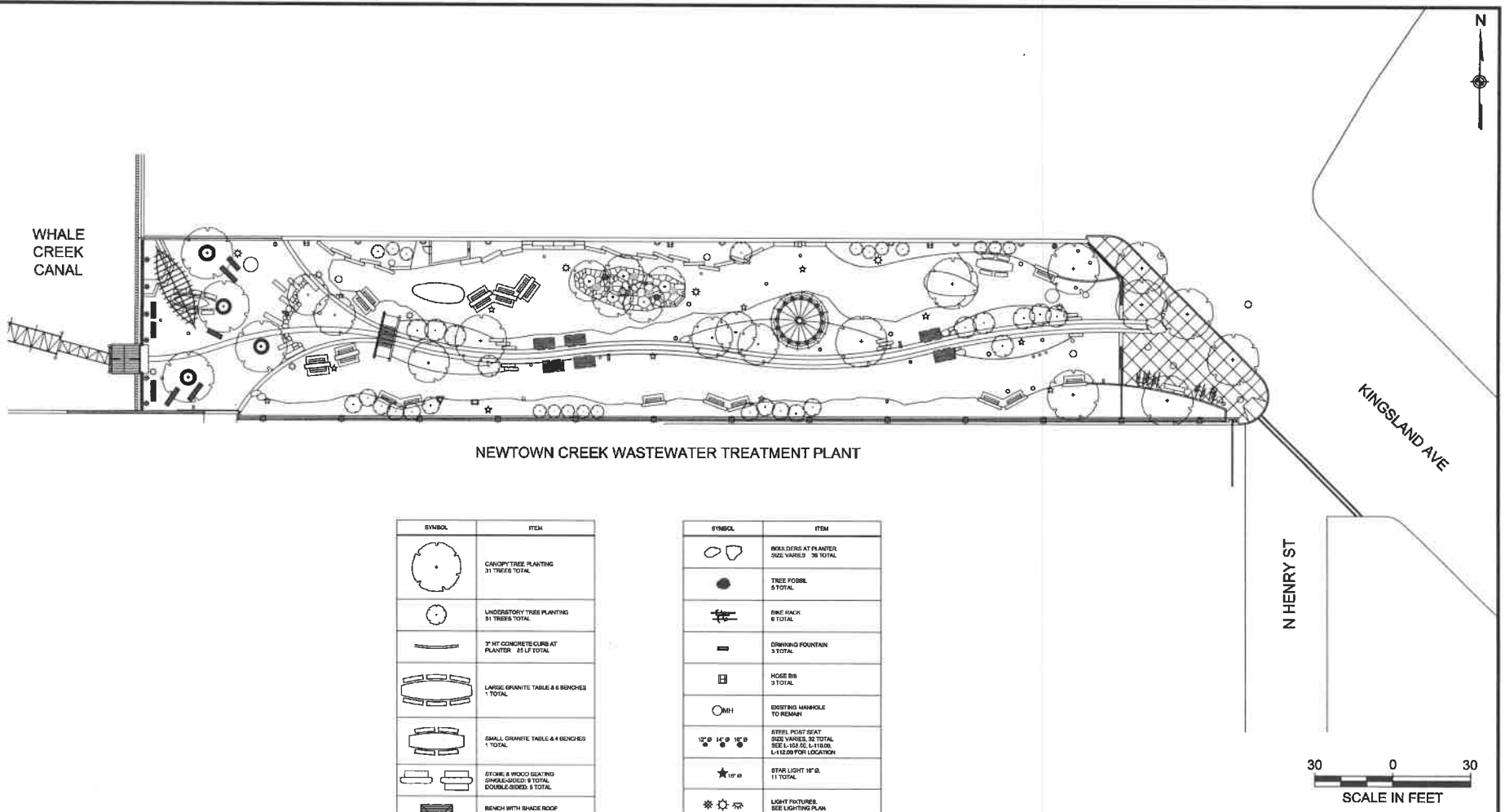
DDC ID NO: NC-61A WOL NO: 12501-LIRO-3-11330

TOPOGRAPHIC SITE LOCATION MAP

NEWTOWN CREEK NATURE WALK
EXTENSION - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 3/2017	FIGURE: 1

J:\15-008-0265 2015 DDC BEGS\Projects\Phase I - Phase II\12501 Newtown Creek RAP & CHASP\CAD\Newtown Corridor Topo Map.ai



SYMBOL	ITEM
	CANOPY TREE PLANTING 31 TREES TOTAL
	UNDERSTORY TREE PLANTING 51 TREES TOTAL
	3" HT CONCRETE CURB AT PLANTER 85 LF TOTAL
	LARGE GRANITE TABLE & 6 BENCHES 1 TOTAL
	SMALL GRANITE TABLE & 4 BENCHES 1 TOTAL
	STONE & WOOD SEATING SINGLE-SIDED: 9 TOTAL DOUBLE-SIDED: 5 TOTAL
	BENCH WITH SHADE ROOF 5 TOTAL
	BENCH WITH SHADE ROOF WITH PV PANEL 1 TOTAL
	STRAIGHT STONE BENCH LENGH VARIES, 17 TOTAL
	TIMBER SEAT LENGTH VARIES, 8 TOTAL
	WOOD PLANTING EDGE 19 TOTAL
	GRANITE BLOCK LINEAR BOULDER 11 TOTAL
	FEATURE BOULDER AT KINGSLAND AVENUE 1 TOTAL

SYMBOL	ITEM
	BOULDERS AT PLANTER SIZE VARIES 36 TOTAL
	TREE FOSSIL 5 TOTAL
	BIKE RACK 6 TOTAL
	DRINKING FOUNTAIN 3 TOTAL
	HOSE BIB 3 TOTAL
MH	EXISTING MANHOLE TO REMAIN
12"Ø 14"Ø 16"Ø	STEEL POST SEAT SIZE VARIES, 32 TOTAL SEE L-103.02, L-111.00, L-112.00 FOR LOCATION
16"Ø	STAR LIGHT 16" Ø, 11 TOTAL
	LIGHT FIXTURES, SEE LIGHTING PLAN
	TRASH RECEPTACLE, 3 TOTAL
	PV BATTERY POLE, 1 TOTAL
	STEEL EDGING
	INFORMATION SIGN FOR BORING
	INFORMATION SIGN FOR STAR SEAT OR STONE DRINKING FOUNTAIN, SEE PLANS FOR LOCATION
	INFORMATION PLAQUE FOR TREE FOSSILS

NOTES:

1. REMEDIAL EXCAVATION LIMITS SHALL BE WITHIN THE ENTIRE NATURE WALK PHASE 3 SITE BOUNDARIES.
2. EXCAVATION DEPTHS SHALL BE AS REQUIRED AND/OR AT THE DIRECTION OF THE ENGINEER.

Department of Design and Construction

LiRo Engineers, Inc.
3 Aerial Way, Syosset, New York

DDC ID NO: NC-61A WOL NO: 12501-LIRO-3-11330

SITE PLAN

NEWTOWN CREEK NATURE WALK
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 03/0217	FIGURE: 2

Appendices

Appendix A Construction Health and Safety Plan (CHASP)

APPENDIX 3

CONSTRUCTION HEALTH AND SAFETY PLAN

Newtown Creek Nature Walk Extension Phase 3
329 Greenpoint Avenue
Brooklyn, New York

March 2017

Prepared for:

NYC DDC Department of Design and Construction

Office of Environmental and Geotechnical Services

30-30 Thomson Avenue, Third Floor

Long Island City, New York 11101

Prepared by:

LiRo Engineers, Inc.

703 Lorimer Street

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PROJECT NO. 15-008-0265

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1.0 INTRODUCTION

The purpose of this Construction Health and Safety Plan (CHASP) is to set forth in an orderly and logical fashion, appropriate health and safety practices and procedures to be followed by on-site construction workers during site redevelopment construction activities at the Newtown Creek Nature Walk Extension Phase 3 site located at 329 Greenpoint Avenue, Borough of Brooklyn, New York (herein referred to as the Site). The Remedial Action Plan (RAP) being developed for the Site will focus on the excavation and removal of contaminated soil to the extent required to construct the park and to place clean cover and surface materials. Clean backfill will also be included within the scope of work. The tasks associated with the rationale for this plan are as follows:

- Excavation and removal of contaminated soil.
- Covering of the project Site area with a minimum of two (2) feet of clean soil and surface materials as required.

This document will serve not only to explain the chemical and physical hazards associated with the RAP, but will also outline approved measures for dealing with such hazards. The Contractor and Site subcontractors are also responsible for implementing health and safety programs to address all other applicable regulations including Occupational Safety and Health Administration (OSHA's) General Industry and Construction Standards.

The procedures presented in this plan comply with the following regulatory or guidance documents.

- United States Environmental Protection Agency (USEPA) National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61.
- OSHA Occupational Safety and Health Regulations, 29 CFR 1910/1926, United States Department of Labor (USDOL), OSHA, March 6, 1990.
- OSHA Occupational Safety and Health Standards for Emergency Action Plan (Means of Egress), 29 CFR 1910.38.
- OSHA Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120.
- USEPA Order 1440.2, Health and Safety Requirements for Employees Engaged in Field Activities, July 12, 1981.
- National Institute for Occupational Safety and Health (NIOSH)/OSHA/USEPA, Occupational Safety and Health Guidance manual for Hazardous Waste Site Activities, October 1985.
- Standard Operating Safety Guides, USEPA, Office of Emergency and Remedial Response, November 1984.

1.1 Scope and Applicability

The purpose of this Construction Health and Safety plan (CHASP) is to define requirements and protocols to be implemented during the implementation of the Remedial Action Plan (RAP) that will be conducted at the Newtown Creek Nature Walk Extension Phase 3 site located at 329 Greenpoint Avenue, Borough of Brooklyn, New York City, New York. The Newtown Creek Nature Walk Extension Phase 3 (herein referred to as the "Site"). The location of the Site is shown on Figure 1. This CHASP is intended to address health and safety issues of on-site construction workers pertaining to environmental concerns discovered during previous environmental investigations.

The New York City Department of Design and Construction (DDC) Office of Environmental and Geotechnical Services' (OEGS) environmental consultant, LiRo Engineers, Inc. (LiRo), the prime contractor, and subcontractors are responsible for implementing health and safety plans and programs for their own employees in accordance with all Occupational Safety and Health Administration (OSHA) requirements. In addition, the prime contractor is responsible for a comprehensive CHASP which addresses all site redevelopment construction activities in accordance with all other applicable OSHA standards (i.e., the General Construction Standard).

1.2 Potential Chemical Hazards

Previous investigations at the Site have identified areas of soil contamination. The potential chemical hazards at the Site include:

- Volatile Organic Compounds (VOCs)
- Semi-Volatile Organic Compounds (SVOCs)
- Metals
- Pesticides

1.3 Emergency Contacts

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the Health and Safety Officer (HSO) and notify the appropriate emergency organization. In the event of a fire or spill, the Site Supervisor will notify the appropriate local, state, and federal agencies.

Organization	Contact	Telephone
Ambulance		911
Police Department / Fire Department		911
Con Edison Co. of New York	Gas or Electrical Emergency	800-752-6633
Project HSO	To be determined	xxx
Site HSO	To be determined	xxx
Site Construction Manager/Supervisor	To be determined	xxx

A map to the nearest hospital is provided as Figure 2.

1.4 Training Requirements

All personnel must have the necessary site-specific training to perform the planned work activities. On-site Health and Safety Briefing given by the Contractor's Project HSO will be conducted prior to initiating the on-site remedial work activities. The briefing will include a review of this Health and Safety Plan (HASP) and Job Hazard Assessments (JHAs) (which are included in Appendix F) with emphasis on the following.

- Protection of the adjacent community from hazardous dust which may be released during intrusive activities.
- Attention to health effects and hazards of substances suspected to be present on-site.
- Hazards and protection against heat/cold.
- The need for vigilance in personal protection and the importance of attention to proper use, fit, and care of personal protective equipment.
- The effectiveness and limitations of personal protective equipment.
- Prescribed decontamination procedures.
- Site control, including work zones, exclusion zone, decontamination zone, access/egress, and security.
- The proper observance of daily health and safety procedures and best management safety practices, such as the entry and exit of immediate work zones and overall Site area.
- Cognizant recognition that all Site personnel are in good physical condition to perform the planned work activities and do not exhibit any adverse health symptoms requiring immediate medical attention and application of simple first aid measures.
- Emergency procedures including emergency evacuation protocols to be followed (with rehearsals) in cases of fire, explosion, or sudden release of hazardous gases.

Should the Site HSO determine that substantial levels of contamination are present (based on visual and olfactory indicators or analytical measurements), he/she shall cease operations and consult with the Project HSO to determine if an upgrade of Personal Protection Equipment is warranted. The Site HSO may also, upon conference with the Project HSO, determine whether or not field conditions warrant the requirement that all personnel conducting field activities should possess certification in health and safety practices for hazardous waste operations as specified in the Federal OSHA Regulations (29 CFR 1910.120 and 1926.65). The aforementioned referenced regulations requires that each employee, at the time of job assignment, receive a minimum of 40 hours of initial training and a minimum of three days of supervised field experience with subsequent 8-hour annual refresher after the initial 40-hour training. All on-site personnel are also required to receive the OSHA 10-Hour Construction Safety Training Certification.

2.0 RESPONSIBILITIES

The following is a summary of the health and safety responsibilities of various project personnel.

2.1 Corporate Health and Safety Officer (CHSO)

The Corporate Health and Safety Officer (CHSO) will provide technical health and safety support to that company's project personnel on an as-needed basis. The CHSO will develop the corporate health and safety programs and objectives and will coordinate safety training programs. The CHSO will monitor health and safety regulations and will provide technical support to personnel to ensure compliance with federal and state safety and health regulations.

2.2 Project Health and Safety Officer (PHSO)

The Project Health and Safety Officer (PHSO) will be responsible for the development and implementation of a site-specific Health and Safety Plan. All personnel involved in on-site activities under the HASP will be required to follow the HASP protocols, as directed by the Site Health and Safety Officer (SHSO). The Primary Contractor and their subcontractor(s) will be required to develop and implement HASPs which conform to the requirements of this HASP.

The responsibilities of the PHSO are also to develop and coordinate the Site Health and Safety Program and provide necessary direction and supervision to the SHSO. He/she will identify the most direct route to the closest hospital. The PHSO will review and confirm changes in personal protection requirements when Site conditions are found to be different than those originally anticipated.

The PHSO will be involved in all discussions on health and safety matters with New York State Department of Environmental Conservation (NYSDEC), OSHA, local health authorities, or other governmental or labor representatives. In addition, this individual will provide the SHSO with details concerning the task-specific health and safety considerations.

2.3 Site Health and Safety Officer (SHSO)

The responsibilities of the SHSO are as follows.

- Ensure on-site personnel are complying with the practices and procedures outlined in the HASP during the implementation of all planned construction work activities.
- Correct and enforce any deviation from HASP practices and procedures.
- Require that all personnel entering the Site understand the provisions of this HASP and sign off on it.
- Conduct periodic training sessions in proper use and maintenance of personal protective equipment and safety practices.
- Ensure all on-site personnel has the proper personal protective equipment to perform their scheduled tasks.
- Conduct periodic emergency response drills.

- Conduct daily health and safety briefings and subsequent weekly tool box talks to discuss safety issues, concerns, deviations, corrective actions, and lessons learned.
- Ensure all on-site personnel have the proper training to perform the schedule task.
- Direct and advise on-site personnel, visitors, and subcontractor(s) SHSO(s) on all aspects, especially changes, related to health and safety requirements at the Site.
- Administer an air monitoring program.
- Monitor site conditions and determine all necessary changes in levels of personal protection and, if warranted, execute work stoppages.
- Report changes in Site conditions and changes in personal protection equipment requirements to the PHSO.
- Prepare accident/incident reports and discuss all corrective actions and lesson learned with on-site personnel to prevent recurrence.

The SHSO reports directly to the PHSO. The SHSO is a full-time on-site position that can be combined with other duties (i.e., project field engineer or manager) by personnel who have appropriate OSHA training. Typical Field Activity Forms which may be used by the SHSO to document HASP requirements are provided in Appendix A.

2.4 Key Personnel

Personnel responsible for implementation of this CHASP are identified on the following table.

Name	Title	Address	Contact Numbers
To Be Determined	Project Manager		Phone: Cell:
To Be Determined	Corporate Health and Safety Officer (PHSO)		Phone: Cell:
To Be Determined	Project Health and Safety Officer (PHSO)		Phone: Cell:
To Be Determined	Site Health and Safety Officer (SHSO)		Phone: Cell:

3.0 SITE BACKGROUND

The NC-61A Site is located at 329 Greenpoint Avenue (the "Site") in the Greenpoint neighborhood of the Borough of Brooklyn, New York. The Site consists of a vacant lot approximately 430 feet long and 360 feet long by 70 feet wide (approximately 0.7-acre trapezoidal area) and is bounded by the intersection of North Henry Street and Kingsland Avenue to the east, Whale Creek to the west, Newtown Creek Wastewater Treatment Plant to the south, and the former Department of Sanitation (DSNY) to the north. The Site is situated in an area characterized by predominantly industrial uses.

The proposed Nature Walk Site has been subject to City Environmental Quality Review (CEQR) and a CEQR negative declaration was issued on February 17, 2016.

3.1 Project Background/Scope of Work

Excavation for the construction of the Newtown Creek Nature Walk Extension Phase 3 is planned. The construction activities will consist of a waterfront park including boundary walls and fences with lockable pedestrian and vehicular gateways, parking, a shade structure, fixed seating and tables, planted areas, lighting, and signage. Nature Walk Phase 3 design also includes provisions to maintain access to the New York City Department of Environmental Protection (NYCDEP) Floatables Collection Facility that presently exist along the eastern side of Whale Creek Canal.

4.0 TRAINING REQUIREMENTS

All personnel must receive adequate site-specific training, in the form of an On-site Health and Safety Briefing given by the PHSO prior to participating in on-site field work. The briefing will include a review of this HASP with emphasis on the following.

- Protection of the adjacent community from dust which may be released during RAP activities.
- Attention to health effects and hazards of substances known to be present on-site.
- Hazards and protection against heat/cold stress.
- The need for vigilance in personal protection and the importance of attention to proper use, fit, and care of personal protective equipment.
- The effectiveness and limitations of personal protective equipment.
- Prescribed decontamination procedures.
- Site control, including work zones, exclusion zone, access/egress, and security.
- The proper observance of daily health and safety practices, such as the entry and exit of work zones and site, proper hygiene during lunch, break, etc.
- Cognizant recognition that all Site personnel are in good physical condition to perform the planned work activities and do not exhibit any adverse health symptoms requiring immediate medical attention and application of simple first aid measures.
- Emergency procedures to be followed (with rehearsals) in cases of fire, explosion, or sudden release of hazardous gases.

Health and Safety Meetings will be conducted daily by the SHSO and will cover protective clothing and other equipment to be used that day, potential chemical and physical hazards, emergency procedures, JHAs, and conditions and activities from the previous day including any corrective action taken and lessons learned.

Should the SHSO determine that substantial levels of contamination are present (based on visual and olfactory indicators and/or analytical measurements), he/she may cease operations and consult with the PHSO to determine if an upgrade of Personal Protection Equipment is warranted. The SHSO may also, upon conference with the PHSO, determine whether or not field conditions warrant the requirement that all personnel conducting field activities should possess certification in health and safety practices for hazardous waste operations as specified in the Federal OSHA Regulations (29 CFR 1910.120) and 1926.65 of the aforementioned referenced regulations requires that each employee, at the time of job assignment, receive a minimum of 40 hours of initial site training and a minimum of three days of supervised field experience with subsequent 8-hour annual refresher after the initial 40-hour training. All on-site personnel are also required to receive the OSHA 10-Hour Construction Safety Training

Certification.

5.0 MEDICAL SURVEILLANCE REQUIREMENTS

All personnel who engage in hazardous waste site activities for 30 days or more per year are required to participate in a Medical Surveillance Program. All project personnel involved in on-site activities in the contaminated area(s) at the Site will be required to undergo annual medical examinations. This examination must take place not more than one year prior to and one year after the completion of Site work and must be conducted by a physician who is board-certified in occupational medicine. The physician will have been made familiar with the job-related duties of each worker examined.

Components of the Medical Surveillance Program are shown in Table 5-1. The physician must certify whether the individual is fit to conduct work on hazardous waste sites using personal protection, or whether he or she must work within certain restrictions.

Any person exposed to high levels of hazardous substances will be required to undergo a repeat medical exam at or before the conclusion of the project to determine possible health impacts. Any person suffering a lost-time injury or illness must receive medical approval prior to returning to work on-site. When employment is terminated for any reason, the employee must receive an exit medical examination.

All medical records will be held by the employer for the period of employment plus at least 30 years, in accordance with OSHA regulations on confidentiality and any other applicable regulations and will be made available to OSHA upon request.

TABLE 5-1

COMPONENTS OF MEDICAL SURVEILLANCE

- Medical and occupational history
- Physical examination, with particular attention to the cardiopulmonary system, general physical fitness, skin, blood-forming, hepatic, renal, and nervous systems
- Urinalysis, to include:
  - color
  - appearance
  - specific gravity
  - pH
  - ketones
  - protein
  - glucose
  - blood
  - bilirubin
  - leukocyte esterase
  - nitrite
  - WBC
  - RBC
  - casts
  - bacteria
  - epithelial cells
  - crystals
  - yeasts
  - heavy metals - arsenic, lead, mercury
- Blood analysis, to include:
  - complete blood count
  - hemoglobin
  - albumin, globulin, total protein
  - bilirubin - direct and total
  - g-glutamyl transpeptidase
  - serum glutamic oxalacetic transaminase
  - lactic dehydrogenase
  - alkaline phosphatase
  - sodium
  - potassium

TABLE 5-1 (Continued)

- chloride
- magnesium
- calcium
- phosphorus
- lead
- uric acid
- BUN (blood urea nitrogen)
- creatinine
- cholesteral
- triglycerides
- glucose
- iron

- Pulmonary function test

- Additional tests as appropriate, including:
  - chest X-ray
  - electrocardiogram
  - audiogram

6.0 SITE HAZARD EVALUATION

This Chapter is intended to prepare on-site construction workers for any possible hazards that may be present on-site and specific hazards that are known based on previous investigation results. The chemical hazards identified in previous investigation work, are volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and pesticides and are further-discussed in Section 6.1.

The general Site construction hazards are discussed below.

6.1 Chemical Hazards

Health/safety characteristics and exposure limits of contaminants known or suspected at the project Site are listed in Table 6-1. The risk of exposure can be by dermal contact, ingestion of contaminated soil, and inhalation from wind dispersion of fugitive dust from the Site.

Health hazard information and procedures, including respiratory and personal protection levels, will be evaluated in the event that additional environmental contaminants are detected at the Site.

All personnel must assume that the disturbance of soil through excavation and removal of contaminated soil to the extent required to construct the park and place clean cover and surface materials at the Site could potentially result in employee exposure to any of the contaminants identified in Table 6-1. Therefore, appropriate levels of respiratory protection and personal protective clothing and equipment will be required to ensure worker safety during intrusive activities. Levels of respiratory protection and the required clothing for each exposure level are further defined in Section 8 of this CHASP, Personal Protection.

TABLE 6-1

HAZARD CHARACTERISTICS OF CONTAMINANTS AT THE ACTIVE RECREATION AREA, MARINERS MARSH PARK

Substance	Flammability/Reactivity	Toxicity/Carcinogenicity	Standards*
Volatile Organic Compounds (VOCs)	Normally Class 1B flammable liquids, strong oxidizers	Generally of low toxicity; C-1 through 3 compounds are simple inert asphyxiates; C-4 through 9 compounds may cause respiratory tract irritation and anesthetic effects, they may also produce dermatitis.	Includes a wide variety of compounds, field measuring instruments are normally calibrated to benzene, since it has the lowest OSHA Permissible Exposure Limit (PEL) of 1 parts per million (ppm). OSHA and Air Force Occupational Safety and Health (AFOSH) have set a PEL of 400 ppm per 8-hour workday, 40-hour workweek. NIOSH recommends that workplace air levels not exceed 350 mg/m^3 for a 40-hour workweek.
Semi-Volatile Organic Compounds (SVOCs)	Normally flammable liquids with strong irritating odors, strong oxidizers	May cause respiratory tract irritation and anesthetic effects, they may also produce dermatitis, headaches and nausea.	NIOSH 100 ppm
Metals			
Arsenic	Non-combustible in solid form. Slight combustible hazard in powder form	Toxic by ingestion, skin absorption, and inhalation of dust or fumes. Neurological, pulmonary and renal toxin.	0.002 mg/m^3 (NIOSH Recommended Exposure Limits (REL)) (15-min.) 0.010 mg/m^3 (OSHA PEL)
Barium	Flammable solid, dangerous when wet. Keep away from ignition sources. Contact with water produces flammable gas.	Highly toxic by ingestion. Skin irritation causes redness and burns. Ingestion causes nausea, vomiting and headaches. Target organs-central nervous system and kidneys.	TWA 10 mg/m^3 (total) TWA 5 mg/m^3 (respiratory (resp)) (NIOSH REL) TWA 15 mg/m^3 (total) TWA 5 mg/m^3 (resp) (OSHA PEL)
Cadmium	Not flammable. Emits toxic fumes when heated	Toxic by ingestion and inhalation of dust or fumes. Induces pulmonary edema and dyspnea. Pulmonary and renal toxin. Confirmed human carcinogen.	2.5 ug/m^3 (OSHA ACTION LIMIT 8-hr. TWA) 5.0 ug/m^3 (OSHA PEL-TWA)
Chromium	Reacts with strong oxidizers and alkalis	Toxic by ingestion, skin absorption, and inhalation of dust or fumes.	0.5 mg/m^3 (NIOSH REL-TWA) 1.0 mg/m^3 (OSHA PEL-TWA)
Copper	Reacts with oxidizers, alkalis, sodium azide and acetylene	Toxic by ingestion, skin absorption, and inhalation of dust or fumes.	1.0 mg/m^3 (NIOSH REL-TWA) 1.0 mg/m^3 (OSHA PEL-TWA)

Substance	Flammability/Reactivity	Toxicity/Carcinogenicity	Standards*
Lead	Not flammable. Emits toxic fumes when heated	Toxic by ingestion and inhalation of dust or fumes. Lead poisoning in children is common. Neurological toxin and reproductive hazard	30 ug/m^3 (OSHA ACTION LIMIT 8-hr. TWA), 50 ug/m^3 (OSHA PEL-TWA)
Mercury	Not flammable. Emits toxic fumes when heated	Toxic by ingestion, skin absorption and inhalation of vapors and fumes. Neurological, pulmonary and renal toxin	NIOSH REL 0.1 mg/m^3 (Other) NIOSH REL TWA 0.05 mg/m^3 (Vapor)
Pesticides	Combustible solid. Reacts with strong oxidizers, alkalis	Exposure through inhalation, skin absorption, ingestion, skin/eye contact. Symptoms include skin/eye irritation; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise, headache, exhaustion; convulsions; vomiting. Potential occupational carcinogen	0.5 mg/m3 (NIOSH REL-TWA) 1.0 mg/m3 [skin] (OSHA PEL-TWA)

NOTES-

1) - Standards are 8-Hour Time-Weighted Averages (TWAs) unless otherwise noted.
2) - Adopted values are limits which have been proposed for the first time, or for which a change in the "Adopted" listing has been proposed under the notice of intended changes by the American Conference of Governmental Industrial Hygienists.
3) - TLV-C-Ceiling - The exposure that should not be exceeded, even instantaneously.
4) - TLV-STEL - Short term exposure limit - 15 minute TWA exposure which should not be exceeded at any time during a workday.

REFERENCES

"Threshold Limit Values and Biological Exposure Indices for 1990-1991." American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1990.
Department of Labor, Occupational Safety and Health Administration, 29 CFR, Part 1910, Air Contaminants, Final Rate, January 19, 1989.
"Pocket Guide to Chemical Hazards." National Institute for Occupational Safety and Health Administration, Publication No. 90-117, Cincinnati, Ohio, June, 1990.
Hawley, Fessner G. The Condensed Chemical Dictionary, Tenth Edition, New York: Van Nostrand Reinhold, 1981.
Sax, R. Irving. Dangerous Properties of Industrial Materials, Sixth Edition, New York, Van Nostrand Reinhold, 1984.

6.2 Radiation Hazards

No radiation hazards are known or expected at the Site.

6.3 Biological Hazards

6.3.1 Animals

During Site operations, animals such as deer, dogs, cats, pigeons, sea gulls, mice, and rats may be encountered. Workers should use discretion and avoid all contact with animals. Bites and scratches from animals can be painful and if the animal is rabid, the potential for contracting rabies exists. Contact with mice and rat droppings may lead to contracting Hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis; crytococcosis and histoplasmosis are also diseases associated with exposure to dried bird droppings but these are less likely to occur in this occupational setting.

6.3.2 Insects

Insects, including bees, wasps, hornets, mosquitoes, and spiders, may be present at this Site. Some individuals may have severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis. Personnel that may have been bitten or stung by an insect at the Site should notify the SHSO of such immediately. The following is a list of preventative measures.

- Apply insect repellent prior to fieldwork and/or as often as needed throughout the shift.
- Wear proper protective clothing (work boots, socks, and light colored pants).
- When walking in wooded areas, to the extent possible, avoid contact with bushes, tall grass, or brush.
- Field personnel who may have insect allergies (e.g., bee sting) should provide this information to the SHSO prior to commencing work, and will have allergy medication on-site and informed SHSO of its location.

The SHSO will instruct the project personnel in the recognition and procedures for the encountering potentially hazardous insects at the Site.

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. This flu like illness occurs out of season, commonly happening between May and October when ticks are more active. Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis. If personnel feel sick or have signs similar to those above, they should notify the SHSO immediately.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetation covered areas. If a tick is found biting an individual, the SHSO

should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe.

6.4 Physical Hazards

Physical hazards include the dangers of tripping and falling on uneven ground, sharp objects from debris lying around Site, operation of equipment such as chainsaws and lawn equipment, and potential utilities either above-ground or buried. The following are physical hazards which may be encountered during RAP activities.

6.4.1 Tripping Hazards

An area of risk associated with on-site activities is presented by overgrown vegetation or equipment which may be present at the Site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark (with orange paint) or remove any obstacles within the work zone.

6.4.2 Cuts and Lacerations

Field activities that involve clearing and removing overgrown vegetation, installation of fencing, and removal of debris usually involve contact with various types of machinery and potential sharp objects such as broken glass, needles, etc. At least one person on-site must be currently certified in first aid and CPR. Personnel trained and certified in first aid should be prepared to take care of cuts and bruises as well as other minor injuries. A first aid kit approved by the American Red Cross will be available during all field activities.

6.4.3 Lifting Hazards

Improper lifting techniques by workers is one of the leading causes of industrial injuries. Field workers may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautious against lifting objects too heavy for one person.

6.4.4 Utility Hazards

Prior to the start of any intrusive work, the location of aboveground and underground utilities and other structures will be completed by the contractor/subcontractor responsible for completing construction activities.

6.4.5 High Noise Levels

The SHSO will make a determination as to the sound intensity and select appropriate engineering controls. To minimize worker exposure, ear plugs or earmuffs will be used.

6.5 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel which limits the dissipation of body heat and moisture can cause heat stress. The SHSO is responsible for monitoring heat stress in the field team personnel.

It should be noted that during hazardous remediation site work, the use of chemical protective clothing (CPC) can compromise the evaporative cooling from sweat. Personal cooling devices may be effective in protecting workers wearing CPC. NIOSH recommends physiological measurements of oral temperature or pulse rate with the use of total encapsulating clothing levels (Level A protection).

The following prevention, recognition, and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress, and to apply the appropriate treatment.

1. Prevention
   a. Provide plenty of liquids. Available in the Support Zone will be a 50% solution of fruit punch or the like in water, or plain water to be taken with salted foods such as pretzels.

   b. Work in pairs. No individual will attempt to undertake any activity alone.

   c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing, and/or act as a quick-drench shower in case of an exposure incident.

   d. Adjustment of the work schedule. As is practicable, the most labor intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment
   Any person who observes any of the following forms of heat stress, either in himself or in another worker, will report this information to the SHSO as soon as possible.

   a. Heat Rash (or prickly heat):

      Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

      Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.

      Treatment: Remove source of irritation and cool skin with water or wet cloths.

b. Heat Cramps (or heat prostration):

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Sudden development of pain and/or muscle spasms in the abdominal region.

Treatment: Remove the worker to the Contamination Reduction Zone. Provide fluids orally. Remove protective clothing. Decrease body temperatures and allow a period of rest in a cool location.

c. Heat Exhaustion

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes. A serious condition.

Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.

Treatment: Perform the following while simultaneously making arrangements for transport to a medical facility:
Remove the worker to the Contamination Reduction Zone. Remove protective clothing. Lie the worker down on his or her back, in a cool place, and raise the feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of a salt water solution, using one teaspoon of salt in 12 ounces of water. Transport the worker to a medical facility.

d. Heat Stroke

Cause: Same as heat exhaustion. An extremely serious condition.

Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.

Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

6.6 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and/or frost bite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily

available, work/rest regimens should be planned that do not result in significant lowering of metabolic heat load which may worsen cold stress, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light, and numbing of the toes and fingers. The potential for wetting of protective clothing should be of concern, since wet clothing (from sweat or splashes) will provide poor insulation against the cold.

7.0 SITE CONTROL

In order to keep unauthorized personnel from entering the contaminated work areas during the disturbance of soil through excavation/removal of contaminated soil to the extent required to construct the park and to install the clean cover and surface material, and for good control of overall Site safety, two work zones will be established at the perimeter of the contaminated area work zone. The two work zones are the Support Zone and the Contamination Reduction Zone/Exclusion Zone. Actual zone width will be determined by optimal size of work area and by local obstructions. A brief description of the Site work zones follows.

In addition to the items listed below, Operational Safety Rules are included in Appendix B-2.

7.1 Support Zone

The Support Zone at the Site will be a mobile unit (automobile) including a cellular telephone for communication. The Support Zone will be located as near as practicable to the active work areas and decontamination areas.

7.2 Contamination Reduction Zone/Exclusion Zone

Due to the setting for this project, the Contamination Reduction Zone and Exclusion Zone will be incorporated into one zone. The Contamination Reduction Zone/Exclusion Zone will be established within the area where the excavation/removal of contaminated soil is conducted and in the area where the park, clean cover and surface materials will be installed. The decontamination of personnel and light equipment will be performed at each location as described in Section 9 and Appendix D.

7.3 Temporary Storage Facilities

A temporary storage location will be established at the Site for the storage of any decontamination water and disposable clothing. The facility will be situated away from vehicular and pedestrian traffic.

7.4 Site Visitation

It is possible that officials/representatives from NYCDEP, DDC and other regulating bodies with jurisdiction will visit the Site during operations. It is also possible that an OSHA representative will wish to inspect the Site. If visiting the Site location where contamination is present, all such officials must meet the same training requirements of on-site contaminated area workers before going into any active Contamination Reduction Zone/Exclusion Zone. Visitors other than NYCDEP, DDC or OSHA representatives will be subject to the additional requirements of having to receive written permission from NYCDEP and DDC to conduct a Site visit. Because of the nature of the work, contaminated area work zones will be continually supervised. Signs will be used to prevent the entrance of unauthorized visitors.

All visitors must supply their own personal protective equipment.

7.5 Traffic Control

Work zone traffic control will be implemented at the Site during Site work. Traffic control methods can include devices (i.e., cones, barricades, etc.), additional staff (i.e., flagger/spotter), etc. The flagger/spotter can assist with relocating heavy construction equipment and trucks around the Site, access and egress of open excavation areas, sloping or shoring open excavations if it extends beyond four feet below ground, etc.

8.0 PERSONAL PROTECTION

Based on known Site contaminant levels, work at the Site is planned to begin in Level D personal protective equipment. However, since unexpected levels of hazardous materials may become evident, various levels of protection will be available during Site activities. Components of all levels of personal protection that will be available are listed in Table 8-1. Planned levels of protection for various activities are given in Table 8-2.

In the event that unexpected levels of organic vapors are encountered, any personnel working at Level D or modified level D protection will cease operations. The SHSO will consult with the PHSO to decide if a higher level of personal protection is required as well as if and when Level D or Level D+ protection may be resumed.

Some modification in safety equipment (e.g., switching from polycoated disposable coveralls to standard disposable coveralls) may be implemented in order to balance concerns for full contaminant protection against concerns for the possibility of heat stress resulting from the need to wear more restrictive protective equipment. Such modifications may be implemented only if approved in advance by the SHSO, following consultation with the PHSO. Protective equipment which fully complies with the requirements of all required levels of protection will be immediately available at all times on the Site.

Level C respiratory protection will normally be provided using NIOSH-approved full-face respirators, with P100 combination filter cartridges approved for removal of organic vapors, particulate, gases, and fumes. The HEPA/OVA filter cartridges will be changed at the end of each workday or when breakthrough occurs, whichever comes first. All team members will be fit-tested for respirators using irritant smoke. Due to difficulties in achieving a proper seal between face and mask, persons with facial hair will not be allowed to work in areas requiring respiratory protection. Complete respiratory protection program requirements for the project are included in Appendix C.

A Site log with required sign-in and sign-out procedures will serve to document the amount of time spent on-site by each field member.

In addition to the personal protection identified above, Personal Safety Rules are included in Appendix B-1.

TABLE 8-1

COMPONENTS OF PERSONAL PROTECTION LEVELS

Level D Protection	Modified Level D Protection
Safety glasses with side shields (or goggles)	Safety glasses with side shields (or goggles)
Hard Hat	Hard Hat
Face Shield (optional)	Face Shield (Optional)
Ordinary coveralls	Standard disposable coveralls
Ordinary work gloves	Inner gloves of snug-fitting latex or vinyl
Steel-toe, steel-shank work shoes or boots (chemical resistant)	Outer gloves of neoprene or nitrile
Ordinary work gloves	Steel-toe, steel-shank work shoes or boots (chemical resistant)
	Outer boots of neoprene or butyl rubber
	Disposable outer "booties"

TABLE 8-2

PLANNED LEVELS OF PERSONAL PROTECTION FOR EACH ACTIVITY

Field Activity			Level of Protection
A.	Non-Intrusive Activities		
	1.	General Site Activities	D
	2.	Support Zone Activities	D
B.	Intrusive Activities		
	*1.	Site Clearing.....	D
	*2.	Excavation Activities	D
	*3.	Equipment Decontamination	D

* These are the levels of protection at which work will commence during the various activities on the Site. Due to on-site conditions and as directed by the SHSO, it may become necessary to upgrade or downgrade the level of personal protection.

9.0 DECONTAMINATION PROCEDURES

9.1 Decontamination of Personnel

Decontamination of personnel and PPE will be performed at each Contamination Reduction Zone/Exclusion Zone. This can be accomplished by washing and rinsing the outer gloves and outer boots over a portable decontamination trough. Disposable clothing can then be removed and discarded into a 30-gallon trash can with a vinyl liner. If personnel are wearing respiratory protection, the above procedures will be followed and the respirator will be removed, sanitized, and placed in a plastic bag. Decontamination procedures for various levels of personnel protection are provided in Appendix D.

9.2 Decontamination of Equipment

All equipment, including large and small equipment, will be decontaminated at the Site prior to transport off-site. Following is a summary of typical decontamination procedures.

Large equipment - A decontamination pad should be established for cleaning of heavy equipment or large sampling tools. This pad can be a prefabricated area that already exists on site for washing large equipment, or can be constructed. The decontamination pad shall have characteristics that allow for collecting fluids and solids that will fall off the large equipment. Decontamination wash water and solid wastes should be collected/containerized and transported off-site to a disposal facility that is permitted to receive the waste.

Small equipment - For small equipment decontamination, a smaller station is established. For this station, clean buckets or tubs (5-gallon buckets are most common) should be used. Buckets should be placed on plastic sheeting to prevent spillage to the ground, and to help keep the decontamination area and equipment as clean as possible.

A clean area, generally covered with plastic sheeting or large clean plastic bags, is also needed to set down decontaminated equipment prior to reuse or air drying and packaging for later use. A stainless steel rack (e.g., grill for barbecue) can often help drying activities.

9.3 Remedial Activity-Derived Waste

All personal protective equipment related remedial activity-derived waste materials (personal protective equipment, decontamination waste) will be placed in labeled containers and appropriately disposed.

10.0 EMERGENCY PROCEDURES

Emergency procedures established to respond to potential incidents are covered under the sections that follow.

10.1 Communications

A cellular telephone will be maintained by the SHSO (Phone # *TBD*) during the entire project.

10.2 Escape Routes

As part of the pre-job safety meeting, workers will be informed of approved escape routes and the primary assembly area for the purpose of accountability.

In the event of a sudden release of hazardous materials, or fire, all personnel will be required to immediately leave the work area and proceed to the assembly area through approved escape routes. This may require personnel to move from the Exclusion Zone directly into an off-site area without proper decontamination. At the conclusion of the emergency, they should move to the Contamination Reduction Zone for proper decontamination.

10.3 Evacuation Signal

In the event of a sudden release, fire or other catastrophe requiring immediate evacuation of the Site, an alarm signal will be sounded. Sounding of an air horn (or similar) will be the responsibility of the contractor or other designated representative(s). NYCDEP, the Project Manager, and the PHSO will be notified by telephone, and later by written report, whenever a Site evacuation is executed.

10.4 Other Signals

Emergency hand signals for use by personnel wearing air-purifying respirators are summarized in Table 10-1.

TABLE 10-1

EMERGENCY HAND SIGNALS

Hand Griping Throat	- Can't breathe
Grip partner's wrist, or place both hands around wrist	- Leave area immediately, no debate
Hands on top of the head	- Need assistance
Thumbs up	- I am alright, OK, I understand
Thumbs down	- No, negative

10.5 Fire/Explosion

It will be the responsibility of the contractor to have a fire extinguisher available at the work location. Contractor personnel (employees and supervisors) have the responsibility for initiating fire prevention measures such as the continuous removal of combustible and flammable debris from the work area and its appropriate decontamination and disposal.

In the event of a fire that cannot be controlled with available equipment, or in the event of an explosion, the local fire department will be summoned immediately by the SHSO, who shall apprise them of the situation upon their arrival. Subsequent notifications will be made to NYCDEP, DDC, and all other pertinent parties associated with the project.

10.6 First Aid

First aid for personal injuries will be administered by the SHSO. If a Site worker should require further treatment, he will be transported to the hospital in a vehicle maintained on-site for this purpose or an ambulance will be summoned. The on-site vehicle will carry written directions to the hospital as well as a map showing the route.

All accidents, however insignificant, will be reported to the SHSO. Personnel designated to administer first aid will have received a minimum of eight hours training in first aid and CPR and be certified by the American Red Cross.

10.7 Emergency Assistance

The following list of names, telephone numbers, and location of police, fire, hospital, and other agencies whose services might be required, or from whom information might be needed, will be carried in the on-site vehicle.

- Fire Department: 911
- Police Department: 911
- NYSDEC Emergency Hotline: 1-800-457-7362

The route to the nearest hospital is shown on Figure 2.

If an ambulance should have to be called to the Site, the injured person should meet the ambulance outside the Contamination Reduction Zone/Exclusion Zone if possible. If a head or spinal injury is suspected and the person is unconscious, medical personnel may have to come into the Contamination Reduction Zone/Exclusion Zone. Medical personnel will be given the minimum amount of protective equipment necessary to ensure their safety while providing medical attention. If circumstances permit, proper decontamination procedures will be followed upon leaving the Contamination Reduction Zone/Exclusion Zone.

10.8 Spills

If any petroleum products or hazardous wastes are spilled, the contractor shall contain and clean up these materials in accordance with the project approved spill response plans. Any spill greater than or equal to 5-gallons in size to surface water or sewer must be reported to the NYSDEC within 2 hours of occurrence.

The Waste Management and Spill Control Plan are included in Appendix E.

10.9 Reports

Standard OSHA formats will be used for reporting any emergencies that occur on the Site.

10.10 Accident Investigations and Reporting

10.10.1 Accident Investigations

All accidents requiring first aid which occur incidental to activities on-site will be investigated. The investigation format will include the following:

- interviews with witnesses;
- gathering of all pertinent information;
- photographic documentation, if applicable;
- necessary actions to alleviate the problem; and,
- completion of the accident reporting form.

10.10.2 Accident Reports

In the event that an accident or some other incident such as a fire or an overexposure to organic chemicals occurs during the course of the project, the PHSO will be telephoned within one hour and receive a written notification within 48 hours. The report shall include the

following items.

- Name, telephone number, and location of the contractor.
- Name and title of person(s) reporting.
- Date and time of accident/incident.
- Location of accident/incident.
- Brief summary of accident/incident giving pertinent details, including type of operation ongoing at the time of the accident.
- Cause of accident/incident.
- Casualties (fatalities, disabling injuries).
- Details of any existing chemical hazard or contamination.
- Estimated property damage, if applicable.
- Nature of damage, effect on contract schedule.
- Action taken to ensure safety and security.
- Other damage or injuries sustained (public or private).

11.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. This CAMP was compiled in accordance with New York State Department of Environmental Conservation (NYSDEC's) Division of Environmental Remediation (DER-10) and New York State Department of Health (NYSDOH's) Generic CAMP.

Continuous monitoring for VOCs will be conducted during ground intrusive activities (i.e., excavation). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the excavation. Monitoring will be conducted with a photo-ionization detector (PID) equipped with a 10.6 eV lamp capable of calculating 15-minute running average concentrations. The following actions will be taken based on organic vapor levels measured.

- If total organic vapor levels exceed 5 parts per million (ppm) above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the hot zone, activities will be shutdown.

All 15-minute readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

Continuous monitoring for particulate levels will be conducted during all ground related activities (i.e., clearing of Site, new soil cover). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. Particulate levels will be monitored continuously at the downwind perimeter. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter (PM) less than 10 micrometers in size (PM-10) level (an aerosol/dust monitor). The monitor will be equipped with an audible alarm to indicate exceedance of the action level. Fugitive dust migration will be visually assessed during all work activities. The following actions will be taken based on levels measured.

- If total downwind perimeter PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind perimeter PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

The instrument will be checked daily with a filtered air sample. All readings must be recorded and be available for NYCDEP and Health Department personnel to review.

Fugitive dust generation that could affect Site workers, Site occupants, or the public can be minimized if the majority of work is conducted in moist soil. The source of the dust will be identified, and dust suppression techniques such as misting surfaces with water or covering (required on for on-site stockpiles-if applicable) will be implemented to reduce the generation of fugitive dust. The contractor must maintain dust suppression during ground clearing, excavating, filling, and grading activities at the Site.

12.0 SAMPLE MANAGEMENT

The collection and analysis of samples will require caution, not only to ensure safety of site sampling and support personnel, but also to ensure accuracy of results. At a minimum, Level D personal protective equipment must be worn by sampling personnel. Soil samples will be placed into laboratory provided sample containers and shipped to a NYSDOH certified laboratory under chain of custody control. To minimize hazards to lab personnel, sample volumes will be no larger than necessary, and the outside of all sample containers will be wiped clean prior to shipment.

All samples will be transported only in designated vehicles. Packaging of samples shall follow appropriate protocols. All samples will be placed in a sealed shipping container prior to shipment.

13.0 SAFETY CONCERNS AND CONTINGENCY MEASURES DURING DRILLING AND EXCAVATION OPERATIONS

It is not likely that additional drilling will be required at the site; however, provisions for drilling and excavation are provided below. Subsurface work at the site will be conducted under the OSHA Safety and Health Standards (29 CFR 1926/191) relative to heavy equipment operation.

13.1 Drilling

A mobile Contamination Reduction Zone/Exclusion Zone is established prior to borehole advancement. Monitoring with real-time instrumentation will be performed at the borehole. Action levels will be considered to have been reached when a continuous, steady reading has been observed.

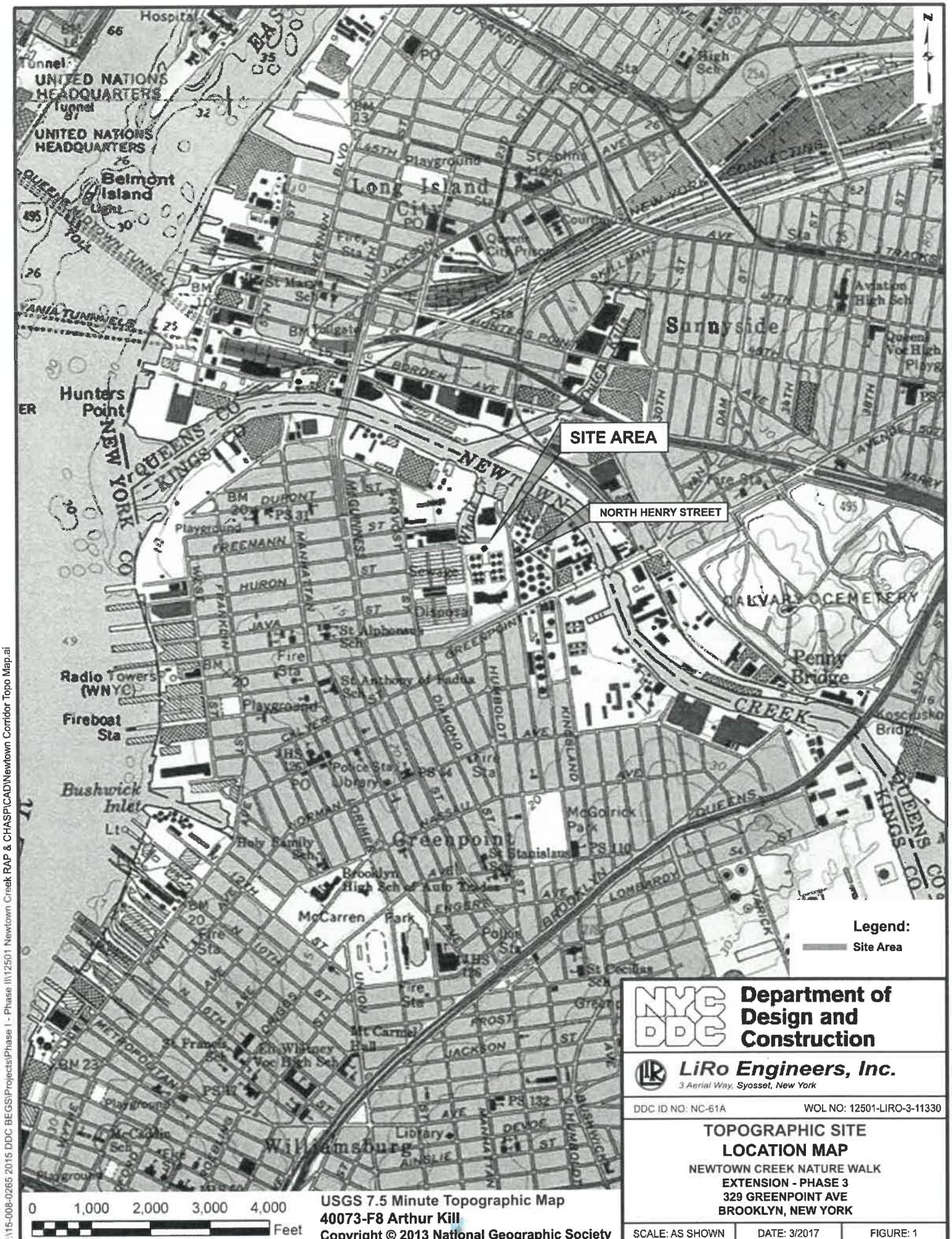
If at any time during drilling operations, buried utilities, USTs, metal, or concrete are penetrated, intrusive work activities will cease immediately. After assessing the situation, the SHSO will decide whether to continue or discontinue drilling. If there is damage to any utility, the SHSO will implement emergency notification procedures and/or spill response procedures.

13.2 Excavation

A mobile Contamination Reduction Zone/Exclusion Zone is established prior to any excavation activities. Monitoring with real-time instrumentation will be performed during the excavation. Action levels will be considered to have been reached when a continuous, steady reading has been observed.

If at any time during excavation operations, buried utilities, USTs, metal, or concrete are penetrated, intrusive work activities will cease immediately. After assessing the situation, the SHSO will decide whether to continue or discontinue drilling. If there is damage to any utility, the SHSO will implement emergency notification procedures and/or spill response procedures.

FIGURES



Department of Design and Construction

LiRo Engineers, Inc.
3 Aerial Way, Syosset, New York

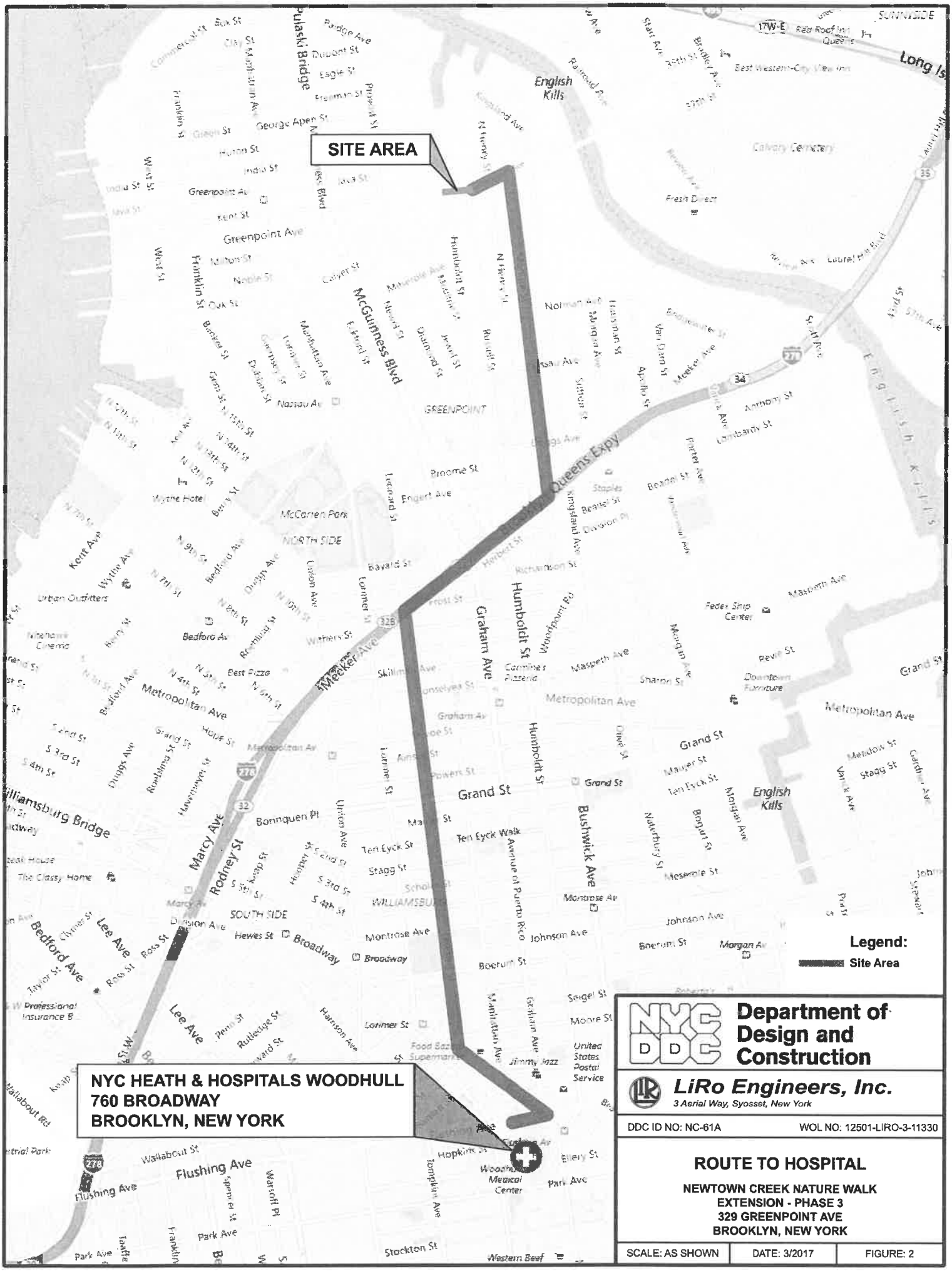
DDC ID NO: NC-61A | WOL NO: 12501-LIRO-3-11330

TOPOGRAPHIC SITE LOCATION MAP

NEWTOWN CREEK NATURE WALK
EXTENSION - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 3/2017	FIGURE: 1

J:\15-008-0265 2015 DDC BEGS\Projects\Phase I - Phase II\12501 Newtown Creek RAP & CHASP\CAD\Newtown Corridor Topo Map.ai



Department of Design and Construction

LiRo Engineers, Inc.
3 Aerial Way, Syosset, New York

DDC ID NO: NC-61A | WOL NO: 12501-LIRO-3-11330

ROUTE TO HOSPITAL

NEWTOWN CREEK NATURE WALK EXTENSION - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 3/2017	FIGURE: 2

J:\15-008-0265 2015 DDC BEGS\Projects\Phase I - Phase II\12501 Newtown Creek RAP & CHASP\CAD\Newtown ROUTE TO HOSPITAL.ai

APPENDIX A

FIELD ACTIVITY FORMS

Air Monitoring Equipment Calibration and Maintenance

All monitoring instruments must be calibrated and maintained periodically. Calibration and on-site maintenance records will be kept in the field log book. The operator must understand the limitations and possible sources of errors for each instrument. It is important that the operator checks that the instrument responds properly to the substances it was designed to monitor. Portable air quality monitoring equipment that measures total ionizables present such as the RaeSystems MiniRae 2000 (or equivalent) photoionization detector (PID) must be calibrated at least once each day. Combustible gas/oxygen meters (explosimeter) such as the MSA Model 360 monitor must be calibrated at least once a week. The specific instructions for calibration and maintenance provided for each instrument should be followed.

INSTRUMENT READING LOG

Project: _____ Job No.: _____
Date: _____ Operator: _____
Instrument: _____ Calibration Component. Date: _____
Sampling Technique: _____
Temperature Range: _____ Humidity: _____ Wind Speed/Direction: _____
Sample Interval: _____
Background Reading: _____
Action Level/Response: _____

Time	Location/Task	Reading (units)	Detection Limit (Scale)

Project Health and Safety Plan and Work Plan Acceptance Form

(For Contractor employees only)

I have read and agree to abide by the contents of the Work Plan and HASP for the following project:

_____ _____

(Project Title) (Project Number)

Further more, I have read and am familiar with the work plan or proposal that describes the field work to be conducted and the procedures to be utilized in the conduct of this work.

Name (print)	Signature	Date

Place in project Health and Safety File as soon as possible

Site-Specific Health and Safety Training

(For all Contractor and subcontract employees on site)

I hereby confirm that site-specific health and safety training has been conducted by the site health and safety officer that included the following.

- Names of personnel responsible for site safety and health
- Safety, health, and other hazards at the Site
- Proper use of personal protective equipment
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the Site
- Acute effects of compounds at the Site
- Decontamination procedures for the following project:

_____ _____

(Project Title) (Project Number)

Name (print)	Signature	Date

Place in project Health and Safety File as soon as possible

ON-SITE SAFETY BRIEFING

Date: _____ Project: _____

Meeting Conducted By: _____

Name

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

HAZARDOUS WASTE ACTIVITIES
HEALTH & SAFETY CHECKLIST

Project: _____

Project Manager: _____

On-site Health & Safety Officer: _____

The Project Manager or on-site Health and Safety Officer will signify the completion of the following items by initializing and dating each item.

	Initial	Date
Site HASP prepared and approved by health and safety manager	_____	_____
All employees who will be on-site:		
• Have received initial (24 or 40 hr.) training	_____	_____
• Have received annual 8 hr refresher training	_____	_____
• Have reviewed the site HASP and received pre-job briefing	_____	_____
• Have received respiratory protective equipment training including SCBA if required	_____	_____
• Have received negative pressure respirator fit test	_____	_____
• Have had a medical exam within the past 12 months	_____	_____

This form is to be submitted to the health and safety director prior to on-site work which may involve exposure to hazardous materials.

CONTRACTOR SITE SAFETY RULES CHECKLIST

The following checklist shall be reviewed and signed by the Prime Contractor, and his subs, and the Project Manager or job Site Supervisor or designees, prior to the scheduled start of a job. While the job is in progress, where applicable, hazardous operations permits shall be obtained on a daily basis, or more frequently, as appropriate to assure safety.

General

☐ All vehicles shall observe a maximum speed limit of 10 MPH, unless otherwise posted. There will be no passing of moving vehicles at job sites when narrow roads and short-sight distances exist.

☐ Hard hat and approved eye protection are required at all times except in designated areas.

☐ Smoking or eating is permitted only in designated areas.

☐ Contractor is expected to maintain good housekeeping during the duration of work. Daily trash pick up is required. At the end of the job the Contractor shall leave the job Site in at least as good an appearance and condition as it was found.

☐ Contractor is to provide first-aid kit. Contractor hereby prescribes emergency hospital as indicated below:
Hospital: _____ Phone: _____

Address: _____

☐ Review with Site Supervisor the emergency evacuation route and telephone location. In case of emergency, notify the Site Supervision immediately and call the appropriate service.

Fire Department: _____

Ambulance: _____

Sheriff: _____

☐ Work rules also prohibit:

- Possession or consumption of intoxicants or illegal drugs or narcotics
- Violation of federal and state safety regulation
- Possession of firearms
- Fighting, horseplay, or practical joking
- Sabotage or pilfering
- Running, except in an emergency

☐ All accident (personal injury or property damage) shall be reported to the job Site Supervisor as soon as emergency conditions no longer exist. The person involved shall make a written accident report prior to leaving the Site, unless prevented by emergency conditions (e.g., injury).

CONTRACTOR SITE SAFETY RULES CHECKLIST (Continued)

☐ There shall be no personnel on the work Site except for authorized contractor/ subcontractor employees without NYCDEP management approval.

☐ NYCDEP representative has discussed with the contractor and his subcontractors, the nature of the potential hazards that may be encountered.

Hazardous Atmospheres and Hazardous Environments

☐ Contractor shall provide his own calibrated combustible gas/oxygen analyzer or other instruments for checking areas before confined space, hot work, or other work in hazardous atmospheres or environments. Contractor is responsible for all testing and monitoring required by applicable regulations. No testing shall be in lieu of above requirements.

☐ Contractor shall provide a standby during confined space work and a fire watch during hot work.

☐ Hot work, confined space entry, line opening procedures, scaffolding, use of heavy equipment, excavations and trenching, and other planned hazardous atmospheres and hazardous environment activities shall be reviewed with Site Supervisor before commencing work.

☐ Contractor personnel shall know the location of the nearest fire extinguisher, fire water line, safety shower, and eye bath.

☐ Any change of conditions around hot work, confined space, or other hazardous atmospheres or hazardous environment areas which could affect pervious test readings or safety conditions shall invalidate all permits and approvals. Retesting or reevaluation of the area, by a designated person, is required before work can be resumed.

Contractors are expected to brief their employees and enforce these rules. NYCDEP and/or DDC representatives may stop or suspend work, at no cost to NYCDEP and/or, any time the Contractor fails to comply with NYCDEP and/or Safety Requirements.

_____
Contractor Signature

_____
Name Printed

_____
Date

_____
NYCDEP/DDC Representative Signature

_____
Name Printed

_____
Date

CONTRACT ACCIDENT REPORT FORM

Project Name: _____

Injured or Ill Employee

1. Name_____ Social Security #_____
   (First) (Middle) (Last)
2. Home Address_____
   (No. and Street) (City or Town) (State and Zip)
3. Age_____
4. Sex: Male (____) Female (____)
5. Occupation_____
   (Specific job title, not the specific activity employee was performing at time of injury)
6. Department_____
   (Enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

Employer

7. Name_____
8. Mailing Address_____
   (No. and Street) (City or Town) (State and Zip)
9. Location (if different from m ailing address):_____
   _____

The Accident or Exposure to Occupational Illness

10. Place of accident or exposure_____
    (No. and Street) (City or Town) (State and Zip)
11. Was place of accident or exposure on employer's premises?_____ (Yes/N o)
12. What was the employee doing when injured?_____
    (Be specific - was employee using tools or equipment or handling material?)
13. How did the accident occur?_____
    (Describe fully the events that resulted in the injury or occupational illness. Tell what happened and how. Name objects and substances involved.)

CONTRACTOR ACCIDENT REPORT FORM (continued)

Give details on all factors that led to accident: (Use separate sheet if needed)

14. Time of accident:_____
15. Date of injury or initial diagnosis of occupational illness:_____
16. Witness(es) to accident:

(Name)	(Affiliation)	(Phone No.)
(Name)	(Affiliation)	(Phone No.)
(Name)	(Affiliation)	(Phone No.)

Occupational Injury or Occupational Illness

17. Describe the injury or illness in detail; indicate part of body affected.

_____

_____

18. Nam e the object or substance that directly injured the employee. (For example, object that struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.)

_____

_____

19. Did the accident result in employee fatality?_____(Yes or No)
20. Number of lost workdays____/restricted workdays_____ resulting from injury or illness?

Other

21. Did you see a physician for treatment?_____(Yes or No)_____(Date)
22. Name and address of physician:

_____

(No. and Street) (City or Town) (State and Zip)

23. If hospitalized, name and address of hospital:

_____

(No. and Street) (City or Town) (State and Zip)

Date of report: Prepared by:

Official position:

ON-SITE SAFETY BRIEFING

Date: _____ Project: _____

Meeting Conducted By: _____

Name

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

TAILGATE SAFETY MEETING

Date: _____ Customer: _____
Specific Location: _____

Safety Topics Presented:

Protective Clothing/Equipment: _____
_____

Chemical Hazards: _____
_____

Physical Hazards: _____
_____

Emergency Procedures: _____
_____

Hospital/Clinic: _____ Phone: _____

Paramedic Phone: _____

Hospital Address: _____

Special Equipment: _____
_____

Other: _____
_____
_____

Attendees:

Name Printed:	Signature:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting conducted by:

_____ _____
Name Printed Signature

APPENDIX B

STANDARD OPERATING SAFETY PROCEDURES

B-1

PERSONAL SAFETY RULES

- Personnel on-site must use the buddy system when wearing respiratory protective equipment.

- Visual contact must be maintained between crew teams on-site.

- Any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in any area designated as contaminated. These practices include as a minimum eating, drinking, chewing gum or tobacco, and smoking.

- Hands and face must be thoroughly washed upon leaving the work area, and before engaging in any other activities, especially eating or drinking.

- Due to interference of facial hair with the mask-to-face seal on air-purifying respirators, personnel working on-site will not be permitted to wear facial hair that interferes with the seal.

- Contact with contaminated surfaces or surfaces suspected of contamination should be avoided. Site personnel should avoid walking through puddles, mud, or other discolored areas, and should not kneel or sit on the ground.

- Field personnel, shall be familiar with the physical characteristics of the Site, including:

  - wind direction in relation to the working area
  - accessibility to associates, equipment, and vehicles
  - communications
  - work zones
  - Site access

- Medicine and alcohol can exacerbate the effect from exposure to toxic chemicals. Prescribed drugs should not be taken by field personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage and controlled substance intake is strictly forbidden during on-site operations.

OPERATIONAL SAFETY RULES

- No visitors shall be allowed on-site without the express permission of the PHSO.
- On-site personnel must use the buddy system when wearing respiratory protective equipment. A third person, suitably equipped, is required as a safety backup during initial Site entries.
- During day-to-day operations, on-site workers will act as a safety backup to each other. Off-site personnel will provide emergency assistance.
- Wind indicators will be set up so as to be visible from the Exclusion Zone.
- Equipment will be kept clean and free of accumulated greases, oils, and other combustible materials.
- No containers or fuels or other flammables will be kept within 100 feet of any equipment.
- Daily briefings will be held to review site hazards, changes in level of personal protection required, special safety precautions for assigned work activities, and emergency response.
- All personnel going on-site must be thoroughly briefed on anticipated hazards, and trained on equipment to be worn, safety procedures emergency procedures, and communications.

APPENDIX C

RESPIRATORY PROTECTION PROGRAM

RESPIRATORY PROTECTION PROGRAM

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ATTACHMENTS

AS REFERENCED IN THE
RESPIRATORY PROTECTION PROGRAM

EXHIBIT 1 Classification and Description of Respirator

EXHIBIT 2 Capabilities and Limitations for Respirators

EXHIBIT 3 Procedures for Conducting a Qualitative Fit-Test

EXHIBIT 4 Respirator Fit Test and Training Record

EXHIBIT 5 Respirator Inspection Chart

RESPIRATORY PROTECTION PROGRAM

1.0 PURPOSE

The standard established uniform guidelines for complying with the requirements of the Occupational Safety and Health Administration (OSHA) for Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations (CFR), and provides organization-wide procedures for the proper selection, use, and care of respiratory protective equipment.

2.0 SCOPE

This standard applies to all projects with potentially airborne exposure.

3.0 POLICY

Every consideration will be given to the use of effective administrative and engineering controls to eliminate or reduce exposure to respiratory hazards to the point where respirators are not required in controlling toxic substances; the company at no charge will provide appropriate respiratory protective equipment to the employee.

Respiratory protective devices will be appropriate for the hazardous material(s) involved, and the extent and nature of the work requirements and conditions.

Employees required to use respirators will be properly fitted, appropriately tested, medically screened, and thoroughly trained in their use.

4.0 CODES AND REGULATIONS

General applicability of Codes and Regulations. Except to the extent that more stringent requirements are written directly into this standard, all applicable codes and regulations have the same force and effect as if copied directly into this standard.

FEDERAL REGULATIONS: Those standards governing the development of this program include, but are not limited to, the following.

Asbestos Regulations - Industrial
Title 29, Part 1910 Section 1001 of the Code of Federal Regulations

Asbestos Regulations - Construction
Title 29, Part 1926, Section 58 of the Code of Federal Regulations

Respiratory Protection
Title 29, Part 1910, Section 134 of the Code of Federal regulations

Access to Employee Exposure and Medical Records
Title 29, Part 1910, Section 20 of the Codes of Federal Regulations

NIOSH/MSHA Approvals for Respirators
Title 42 CFR 84, of the Code of Federal Regulations

American National Standards Institute (ANSI)
American National Standard: Practices for respiratory Protection, Z88, 2-1980.

5.0 DESIGNATION OF ADMINISTRATOR

The designated program administrator is the Corporate Safety Officer who has the responsibility for implementation of, and the adherence to, the provisions of this respiratory protection program. The Corporate Safety Officer will designate a person who is responsible for the enforcement of the program at each job site. This will be the site supervisor/foreman or on-site safety representative.

In order to comply with OSHA's "competent person" requirements, the person designated must have two qualifications. He or she must have experience in identifying and controlling exposures, and authority to promptly prevent and correct hazardous conditions.

6.0 PURCHASE OF APPROVED EQUIPMENT

In order to comply with the provisions of OSHA's Standard on Respiratory Protection, 29 CFR 1910.134, all respiratory protective equipment will have been tested by the National Institute of Occupational Safety and Health (NIOSH) and will carry a joint NIOSH/Mine Safety and Health Administration (MSHA) approval number for that specific respirator assembly.

7.0 RESPIRATORY SELECTION

In selecting the correct respirator for a given circumstance, the following factors be taken into consideration.

Nature of the Hazard - In order to make subsequent decisions, the nature of the hazard must be identified to ensure that an over exposure does not occur. These include oxygen deficiency, physical properties of the hazard, actual concentrations of the toxic substances, the Permissible Exposure Limits (PEL), and the warning characteristics.

Nature of the Hazardous Operations - For proper respirator selection, it is necessary to know the details of the operations which require employees to use devices. These include operations or process characteristics, and work characteristics which may necessitate alternate respirator selection.

Location of the Hazardous Area - This is important in the selection process so that a backup system may be planned, if necessary. Respirable or emergency operations may be planned.

Time Respiratory Protection is Required - The length of time a respirator will have to be worn by an employee is a factor which must be evaluated. This is most pronounced when using SCBA

equipment where, by definition, the air supply is limited. However, time is also a factor during routine use of air purifying respirators when the employee's breathing and comfort become affected by clogged filter cartridges which may need changing.

Employee's Health - Effective usage of a respirator is dependent on an individual's ability to wear a respirator as determined by a physician. Most respiratory devices increase physical stress on the body, especially the heart and lung. Care should be taken to ensure that medical determination has been made that an individual is capable of wearing a respirator for the duration of the work assignment (See Section 11.0 of the Standard).

Work Activity - The type of work activities to be performed while wearing a respirator is vitally important in the respirator selection. The proper respirator will be one which is least disruptive to the task being conducted, yet providing the desired protection.

Respirator Characteristics, Capabilities, and Limitations - The information included within Exhibits 1 and 2 has been obtained from ANSI Z99.2-1980. Exhibits 1 and 2 provide a description of various respirator characteristics, capabilities, and limitations.

Protection Factors - The protection afforded by respirators is dependent upon the seal of the face piece to the face. The degree of protection may be ascertained and a relative safety factor as designed. Protection factors are only applicable if all elements of an effective respirator program are in place and being enforced.

7.1 SELECTION

Where respirators are used, the Corporate Safety Officer will select the appropriate respirator and will ensure that the employee uses the respirator provided.

7.2 COMFORT

Once the type of respirator has been selected, that is applicable and suitable for the purpose intended, the selection process should give consideration to the fit and comfort of the respirator.

The employee should be given the opportunity to select a respirator which provides the most comfortable fit. Since each respirator represents a different size and shape, a respirator which fits better during selection will provide better protection after fit-testing. For this purpose, the employee should be shown how to access a comfortable device and should eliminate those which are obviously ill-fitting.

An assessment of comfort should include the following points.

Chin properly placed
Positioning of mask on nose
Strap tension
Room to talk
Cheeks filled out
Fit across nose bridge
Room for safety glasses
Distance from nose to bridge
Tendency to slip
Hindrance to movement

8.0 ISSUANCE OF EQUIPMENT

When practical, respirators should be assigned to individual employees for their exclusive use and labeled for identification in such a way as not to affect the performance of the respirator.

8.1 FITTING

After the employee has been shown how to assess a respirator, he/she should be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a proper fit.

Note: The instruction should take the form of a review and should not be considered the employee's formal training.

The employee should hold each face piece up to the face and eliminate those which obviously do not give a comfortable or proper fit. Normally, fitting should start with a half-face mask and if a good fit cannot be found, the employee should then try a full-face mask.

8.2 FAMILIARIZATION

Once the proper fitting respirator has been selected, the employee should don the device, adjusting the face piece and tension straps. He/she should wear the mask for as least five minutes before taking it off and putting it on several times, adjusting the straps each time to become familiar with the respirator and adept at setting the proper tension on the straps.

8.3 FIT-TESTING REQUIREMENTS

OSHA requires that respirators be fitted properly and that they be tested for their face piece to face seal. There are currently two methods acceptable for conducting these tests. Qualitative and Quantitative Fit Testing. The Qualitative method is a fast, easily conducted test that can be performed almost anywhere, while the Quantitative method requires the use of bulky test chambers and very expensive electronic equipment. The Quantitative method applies only to negative pressure non-powered air-purifying respirators.

Qualitative fit testing is based on the wearer's subjective response to the test agent of chemical of which the two most popular tests are: the odorous vapor test and the taste test. (See Exhibit 3 procedures). The following represents a brief summary of how to conduct each of these tests.

8.3.1 ODOROUS VAPOR TEST

The odorous vapor test relies on the respirator wearer's ability to detect odorous materials, usually isoamyl acetate saturated material around the outside of the respirator. If the wearer is unable to smell the chemical, then a satisfactory fit is assumed to be achieved.

When an air purifying respirator is tested by this method, it should be equipped with an inorganic vapor cartridge which removes the test vapor from the air.

Note: This test is solely dependent upon the employees honest response; there is no involuntary reaction. For that reason, it is the preferred test method.

8.3.2 TASTE TEST

The taste test relies upon the wearer's ability to detect a chemical substance, usually sodium saccharin, by tasting it inside the respirator. The test performed by placing an enclosure over the respirator wearer's head and shoulders, and spraying the test agent into the enclosure with a nebulizer. If the wearer is unable to taste the chemical, then a satisfactory fit is assumed to be achieved.

Note: This test is totally dependent on the wearer's honest indication of taste. There is no involuntary response and therefore is not preferred as the method of testing. When conducting this type of test, the person being tested must not be allowed to eat, drink, chew gum, tobacco, or smoke.

8.4 FIELD TEST

There are two tests that are used in the field to check the seal of the respirator. These are known as the positive and negative pressure sealing tests. Each of these two tests must be performed every time a respirator is put on, and prior to entering a contaminated area.

Note: Although both the positive and negative pressure tests are considered essential to a good respiratory protection program and should always be used prior to entering an area of exposure, they are recognized solely as a field test and cannot be substituted for the qualitative fit test.

8.4.1 POSITIVE PRESSURE TEST

1. This test only applies to those respirators which have an exhalation valve which can be blocked. The exhalation valve may have to be removed for the test.

2. Close or "block off" the exhalation valve.

3. Exhale gently into face pieces.

4. If a slight pressure is built up, with no apparent outward leakage around face pieces to face, seal is assumed to be satisfactory.

8.4.2 NEGATIVE PRESSURE TEST

1. Close the inlet opening or hose of the respirator face pieces with the hand(s), tape or the other means.

2. Inhale gently so that the face pieces collapse slightly and hold the breath for ten seconds.

3. If the face pieces remains slightly collapsed and no inward leakage occurs, then the face pieces to seal is assumed satisfactory.

8.5 RECORD KEEPING OF TEST RESULTS

A summary of the test results for each employee on whom a qualitative fit test was conducted will be documented on the Respirator Test Summary (See Exhibit 4). This record will then become a part of the employee's medical record and will be retained for the same time period as the medical records.

9.0 TRAINING

Respirators will not be issued to individuals (including company officials, subcontractors, or visitors) who have not received appropriate training and medical clearance.

9.1 TRAINING PROGRAM

The extent and frequency of employee *training depends primarily on the nature and extent of the hazard.* As a minimum, all employees and supervisory personnel will be trained in basic respirator practices. It must be remembered that respirators are effective only when they are acceptable to the employee and worn properly by him/her. Because proper use depends especially upon the wearer's motivation, it is important that the need for the respirator be explained fully.

The basic respirator training program must include the following.

- A discussion of the nature of airborne contaminants against which the employee must be protected and why engineering controls have not been effective in controlling exposure to the point where respirators are not required.

- A discussion of why the respirator, which has been selected for this job, is the proper device for this particular purpose.

- Instruction on the respirator's limitations, emphasizing such things as oxygen deficiency, toxic contaminants which are immediately dangerous to life or health, and the need for change filter cartridges when indicated to do so by testing, or when breathing resistance increases to an uncomfortable level.

- Instructions on how to inspect the respirator and ensure that it is in proper working condition.

- Instructions on how to put on a respirator, how it should be positioned on the face,

how to set strap tension and how to wear the respirator comfortably.

- Instructions on the method of fit-testing used and the proper way to conduct positive and negative pressure test each time the respirator is put on. During this instruction, the wearer must be made to understand that the respirator cannot be used when conditions prevent a satisfactory face piece to face seal. If this condition cannot be corrected, the employee cannot be allowed into the area requiring the use of a respirator.

- Instructions in the proper care and maintenance of the respirator.

- A discussion on the value of medical surveillance and air sample monitoring.

- Field training to recognize and cope with any type of emergency while using the respirator.

9.2 RESPIRATOR TRAINING RECORD

Upon completion of the basic respirator training program, the employee will be required to read and sign the Respirator Training Record (See Exhibit 4) attesting to the fact that they have received the basic training program and fell confident in their ability to use the respirator properly.

The signed and dated Respiratory Training Record will then become part of the employee's medical records and will be retained for the same period of time as those records.

10.0 CARE AND MAINTENANCE

Personnel involved in respirator maintenance must be thoroughly trained. Substitution of parts from different brands or type of respirators invalidate approval of the device. Repairs and adjustments should never be made beyond the manufacturer's recommendations.

10.1 CLEANING THE RESPIRATOR

Respirators must be cleaned and disinfected after each day's use when they are assigned to one individual or after each use if they are assigned to more than one person following procedures are recommended for cleaning and disinfecting the respirator:

- If required, remove and discard filters or cartridges.

- Wash face piece and breathing tube in detergent and warm water (120EF) or cleaner/disinfectant solution. Use a soft brush to facilitate removal of dirt. Cleaner/disinfectant solutions are available from respirator manufacturers or it can be made using a solution of water and household chemicals such as two tablespoons of chlorine bleach to one gallon of water or one teaspoon or tincture of iodine solution is sufficient for disinfecting.

- Rinse completely in clean warm water.
- Air dry in clean air.
- Clean out other parts, as recommended by the manufacturer.
- Inspect the valves, head straps, and other parts - replace with new parts of defective.
- Place face piece in a plastic bag or container for storage in an assigned area.
- Insert new filters or cartridges prior to use, making sure the seals are tight.

10.2 STORING THE RESPIRATOR

When they are not being used, respirators should be individually sealed in plastic bags and stored at convenient locations in order to protect them against dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals. They should be stored in such a way that the face piece and exhalation valve are not being distorted.

10.3 INSPECTING THE RESPIRATORS

All respirators should be inspected before and after use, and at least monthly by a competent person to assure that they are in satisfactory working condition. A general inspection check list should include the following.

- Tightness of connections.
- Conditions of face piece straps, connecting tubes, and cartridge.
- Condition of exhalation and inhalation valves: If the side of the exhalation valve gaps even slightly, it must be replaced with a new valve.
- Pliability and flexibility of rubber parts: Deteriorated rubber parts must be replaced, unused rubber parts should be worked, stretched and manipulated, with a massaging action.
- Proper function of regulations and warning devices.

Respiratory protection is no better than the condition of the respirator in use, even though it is worn conscientiously. Frequently, random inspections must be conducted by a qualified individual to assure that the respirators are properly selected, fitted, used, cleaned, and maintained.

Note: For a detailed respirator check list, refer to the Respirator Inspection Chart in Exhibit 5.

10.4 CARE AND MAINTENANCE RECORDS

A written record should be maintained of the Care and Maintenance program within each individual company. Information contained on this record should include inspection reports, replacement parts used, dates of repair, cleaning and type of disinfectant used and the names of persons doing the work. The respirator should be identified by manufacturer, model, and approval number. Records should be retained for a period of five years.

11.0 MEDICAL REQUIREMENTS

Employees will not be assigned to tasks requiring the use of a respirator unless it has been determined that they are physically able to perform work, and use the respirator.

11.1 MEDICAL EXAMINATIONS

Employees who are working at or above Action Level of a toxic substance for thirty (30) days or more per year, or who are using a negative pressure respirator, will be required to undergo a medical evaluation of the following frequency.

- Prior to assignment of a respirator for those employees who will be issued a negative pressure respirator.

- At least annually thereafter.

Each procedure of the medical examination and evaluation will be performed by or under the supervision of a licensed physician and will include, as a minimum, a chest x-ray both posterior and anterior, a medical and work history and special emphasis directed to the pulmonary, cardiovascular, and gastrointestinal systems to determine the presence of any possible respiratory diseases. A pulmonary function test which will include both the maximum amount of air that can be expired from the lungs after full inhalation (FVC) and maximum amount of air forcibly expired in one second after exhalation (FEV10).

The only exception to this requirement, for an initial medical examination, is if the employee or company can provide adequate records/documentation to show that he/she has been examined in accordance with the provision of this program within the past one (1) year period.

11.2 MEDICAL FORMS

Medical surveillance will be conducted as described in the Health and Safety Plan (HASP). In addition to standardized questionnaires, the physician must also be furnished with a copy of the latest OSHA standards governing the type of exposure the employee will be involved in. A description of the employee's duties as they relate to the exposure, the anticipated exposure level, a description of the respiratory protection equipment to be used, and any available information from the previous medical examinations of the employee must also be furnished to the physician.

At the conclusion of the examination, the physician will submit a written opinion which will contain the results of the examination, conditions discovered by the physician that will prohibit the employee from using a respirator, and any recommendations from the physician regarding the employee's limitations. It will also contain a statement from the physician that he/she has informed the employee of the results of the examination.

A copy of the physician's opinion must be furnished to the employee by the company within thirty (30) days of its receipt by the company.

11.3 MAINTENANCE RECORDS

All records pertaining to the employee's medical examination must be retained for a period of thirty (30) years.

12.0 WORK AREA SURVEILLANCE

Although not specifically discussed in the Respiratory Protection Standard 29 CFR 1910.134, the standards require "appropriate surveillance". This should include identification of the containment, nature of the hazards, concentration at the breathing zone and, if appropriate, biological monitoring. The industrial hygienist who is conducting the air sampling should carefully document any apparent efficiencies in surveillance necessary to the respirator program.

13.0 PROGRAM EVALUATION

The program administration should periodically assess the effectiveness of the respiratory protection program during all phases of operation in which respiration are being used. Frequent walk-through inspections during these activities should be conducted to monitor and document supervisor and worker compliance with the requirements of the program. In addition to specific evaluations of the respirator cleaning, inspection, maintenance, desired results of these operations are consistently achieved.

14.0 VIOLATION AND DISCIPLINARY ACTION

Respirator protection is a crucial part of an overall safety program. As such, mandatory compliance with all aspects of this program, by those employees required to use a respirator, is a condition of continuing employment.

14.1 DISCIPLINARY ACTION

When it has come to the attention of a supervisor that an employee has deliberately removed his/her respirator or broken the face piece seal while in the contaminated area, the employee will be immediately suspended from work and instructed to leave the job site pending a final disposition.

Random spot checks will be conducted to determine the effectiveness of the employee's fit test. Should the check, which will be a positive or negative pressure test conducted under the

direction of a supervisor, indicated that the employee's respirator does not have satisfactory seal, the employee will be advised accordingly and instructed to leave the contaminated area. A written citation will be issued to the employee the first time he/she fails a random check. Two such citations on the same job will be sufficient cause for dismissal.

15.0 REPORTING RESPIRATOR PROBLEMS

Occasionally, the company may find a defect in the design or performance of a respirator. The best course to follow is to report these findings to the administrator of the company's respiratory protection program, which in turn, should report to the Corporate Safety Officer.

The respirator carries with it the approval of the NIOSH, the Corporate Safety Officer will report the findings to the respirator's manufacturer and to NIOSH.

This will be done by notifying the manufacturer of the defect in a report format and forwarding a copy of the report to NIOSH. The report will include the following.

- The employer's name, address, and telephone number.
- The name of the respirator's manufacturer.
- Model number of the respirator.
- The name and part number (if possible) of the defective part.
- A brief description of the respirator's use when the defect was discovered.
- A description of the defect.
- A description of the defects adverse effect on the respirator's performance.

This report should be addressed to the NIOSH Division of Safety Research, testing and Certification Branch, 944 Chestnut Ridge Road, Morgan Town, West Virginia 26595.

EXHIBIT 1

CLASSIFICATION AND DESCRIPTION OF RESPIRATOR BY MODE OF OPERATION

1.0 ATMOSPHERE-SUPPLYING RESPIRATORS

A respirable atmosphere independent of the ambient air is supplied to the wearer.

Self Contained Breathing Apparatus (SCBA). A supply of oxygen, or oxygen-generating material is carried by the wearer. Normally equipped with full face piece, but may be equipped with a quarter-mask face piece, half-mask, helmet, hood or mouth piece, and nose clamp.

1.1 CLOSED-CIRCUIT SCBA (Oxygen only, negative pressure or positive pressure)

1.1.A COMPRESSED OR LIQUID OXYGEN TYPE

Equipped with a face piece or mouth piece and nose clamp. High pressure oxygen from a gas cylinder passes through a high pressure reducing valve and, in some designs, through a low-pressure admission valve to a breathing bag or container. Liquid oxygen is converted to low pressure gaseous oxygen and delivered to the breathing bag. The wearer inhales from the bag, through a corrugated tube connected to a mouth piece or face piece and a one way check valve. Exhaled air passed through check valve and tube into a container of carbon dioxide removing chemical or as the bag deflates sufficiently to actuate an admission valve. A pressure-relief system is provided; and a manual bypass system and saliva trap may be provided depending upon the design.

1.1.B OXYGEN-GENERATING TYPE

Equipped with a face piece or mouth piece and nose clamp. Water vapor in the exhaled breath reacts with chemicals in the canister to release oxygen to the breathing bag. The wearer inhales from the bag through a corrugated tube and one-way check valve at the face piece. Exhaled air passes through a second check valve breathing tube assembly into the canister. The oxygen-release rate is governed by the volume of exhaled air. Carbon dioxide in the exhaled breath is removed by the canister fill.

1.2 OPEN-CIRCUIT SCBA (Compressed air, compressed oxygen, liquid air, liquid oxygen).

A bypass system is provided in case of regulator failure, except on escape-type units.

1.2A DEMAND TYPE C

Equipped with a face piece or mouth piece and nose clamp. The demand valve permits oxygen or air flow only during inhalation. Exhaled breath passes to ambient atmosphere through a valve(s) in the face piece.

1.2.B PRESSURE-DEMAND TYPE D

Equipped with a face piece only. Positive pressure is maintained in the face piece. The apparatus may have provisions for the wearer to select the demand or pressure-demand mode of operation, in which case the demand mode should be used only when donning or removing the apparatus.

1.3 SUPPLIED-AIR RESPIRATOR

1.3.A HOSE MASK

Equipped with a face piece, breathing tube, rugged safety harness, and a large diameter heavy-duty non-kinking air supply hose. The breathing tube and air-supply hose are securely attached to the harness. The face piece is equipped with an exhalation valve. The harness has provisions for attaching a safety line.

1.3.B HOSE MASK WITH BLOWER

Air is supplied by a motor driven or hand operated blower. The wearer can continue to inhale through the hose if the blower fails. Up to 200 feet (91 meters) of hose length is permissible.

1.3.C HOSE MASK WITHOUT BLOWER

The wearer provides motivating force to pull air through the hose. The hose inlet is anchored and filled with a funnel or like object covered with a fine mesh screen to prevent entrance of coarse particulate matter. Up to 75 feet (23 meters) of hose length permissible.

1.4 AIR-LINE RESPIRATOR

Respirable air is supplied through a small diameter hose from a compressor or compressed-air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached readily in an emergency. A flow-control valve or orifice is provided to govern the rate of air to the wearer. Exhaled air passes to the ambient atmosphere through a valve(s) or opening(s) in the enclosure (face piece, helmet, hood or suit). Up to 300 feet (91 meters) of hose length is permissible.

1.4.A CONTINUOUS-FLOW CLASS

Equipped with a face piece, hood, helmet, or suit. At least 115 liters (4 cubic feet) of air per minute to light-fitting face pieces and 170 liters (6 cubic feet) of air per minute to loose-fitting helmets, hoods, and suits is required. Air is supplied to a suit through a system of internal tubes to the head, trunk, and extremities through valves located in appropriate parts of then suit.

1.4.B DEMAND TYPE C

Equipped with a face piece only. The demand valve permits the flow of air only during inhalation

1.4.C PRESSURE-DEMAND TYPE D

Equipped with a face piece only. A positive pressure is maintained in the face piece.

1.4.D COMBINATION AIR-LINE RESPIRATORS WITH AUXILIARY SELF-CONTAINED AIR SUPPLY

Include an air-line respirator with an auxiliary self-contained air supply. To escape from a hazardous atmosphere in the event the primary air supply fails to operate, the wearer switches to the auxiliary self-contained air supply. Devices approved for both entry into and escape from dangerous atmospheres have a low-pressure warning alarm and contain at least 15-minute self-contained air supply.

1.4.E COMBINATION ATMOSPHERE-SUPPLY AND AIR-PURIFYING RESPIRATORS

Provide the wearer with the option of using either of two different modes of operation including the following:

1. An atmosphere-supplying respirator with an auxiliary air purifying attachment which provides protection in the event the air supply fails; or,

2. An air purifying respirator with an auxiliary self-contained air supply which is used when the atmosphere may exceed safe conditions for use of an air-purifying respirator.

2.0 AIR-PURIFYING RESPIRATORS

Ambient air, prior to being inhaled, is passed through a filter, cartridge or canister which removes particles, vapors, gases, or a combination of these contaminants. The breathing action of the wearer operates the non-powered type of respirator. The power type contains a blower - stationary or carried by the wearer - which passes ambient air through an air-purifying component and then supplies purified air to the respirator inlet covering. The non-powered type is equipped with a face piece or mouth piece and nose clamp. The powered type is equipped with a face piece, helmet, hood, or suit.

2.1 VAPOR - AND GAS - REMOVING RESPIRATOR

Equipped with cartridge(s) or canister(s) to remove a single vapor or gas (for example: chlorine gas), a single class of vapors or gases (for example: dust and fume), from air. Filter may be a replaceable part of a permanent part of the respirator. Filter may be the single-use or the reusable type.

2.2 PARTICULATE-REMOVING RESPIRATORS

Equipped with filter(s) to remove a single type of particulate matter (for example: dust), or a combination of two or more types of particulate matter (for example: dust and fume), from air. Filter may be a replaceable part of a permanent part of the respirator. Filter may be the single-use or the reusable type.

2.3 COMBINATION PARTICULATE - AND VAPOR - AND GAS - REMOVING RESPIRATOR

Equipped with cartridge(s) or canister(s) to remove particulate matter, vapors, and gases from air. The filter may be a permanent part, or replacement part of a cartridge or canister.

A. Device procedures negative pressure on respiratory inlet covering during inhalation.

B. Device procedures positive pressure on respiratory inlet covering during both inhalation and exhalation.

C. Equipped with a demand valve that is activated on initiation of inhalation and permits the flow of breathing atmosphere to the face piece. On exhalation, pressure in the face piece becomes positive and the demand valve is deactivated.

D. A positive pressure is maintained in the face piece by a spring loaded or balanced regulator and exhalation valve.

EXHIBIT 2

CAPABILITIES AND LIMITATIONS OF RESPIRATORS

1.0 ATMOSPHERE-SUPPLYING RESPIRATORS

Atmosphere-supplying respirators provide protection against deficiency and toxic atmospheres. The breathing atmosphere is independent of ambient atmospheric conditions.

1.1 GENERAL LIMITATION

Except for some air-line suits, no protection is provided against skin irritation by material such as ammonia and hydrogen chloride, or against sorption of materials such as hydrogen cyanide, tritium, or organic phosphate pesticides through the skin. Face pieces present special problems to individuals required to wear prescriptive lenses (See 9.1). Use of atmosphere-supplying respirators in atmospheres immediately dangerous to life or health is limited to specific devices under specified conditions.

1.2 SELF CONTAINED BREATHING APPARATUS (SCBA)

The wearer carries his/her own breathing atmosphere.

1.2.A LIMITATIONS

The period over which the device will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure (service life of open-circuit devices is cut in half by a doubling of the atmospheric pressure), and the type of work being performed. Some SCBA devices have a short service life (less than 15 minutes) and are suitable only for escape (self-rescue) from an irrespirable atmosphere.

Chief limitations of SCBA devices are their weight or bulk, or both, limited service life, and the training required for their maintenance and sale use.

1.3 CLOSED-CIRCUIT SCBA

The closed-circuit operation conserves oxygen and permits longer service life at reduced weight. The negative pressure type produces a negative pressure in the respiratory-inlet covering during inhalation, and this may permit leakage of contaminants, whereas the positive pressure type always maintains a positive pressure in the respiratory-inlet covering, and is less apt to permit inward leakage of contaminants.

1.3.A OPEN-CIRCUIT SCBA

The demand type produces a negative pressure in the respiratory-inlet covering during inhalation, whereas the pressure-demand type maintains a positive pressure in the respiratory-inlet covering during inhalation, and is less apt to permit inward leakage of contaminants.

1.3.B SUPPLIED-AIR RESPIRATORS

The respirable air supply is not limited to the quantity the individual can carry, and the devices are lightweight and simple.

1.3.B.1 LIMITATIONS

Limited to use in atmospheres from which the wearer can escape unharmed without the aid of the respirator.

The wearer is restricted in movement by the hose and must return to a respirable atmosphere by reacting his/her route of entry. The hose is subject to being severed or pinched off.

1.4 HOSE MASK

The hose inlet or blower must be located and secured in a respirable atmosphere.

1.4.A HOSE MASK WITH BLOWER

If the blower fails, the unit still provides protection, although a negative pressure exists in the face piece during inhalation.

1.4.B HOSE MASK WITHOUT BLOWER

Maximum hose length may restrict application of device.

1.5 AIR-LINE RESPIRATOR (Continuous Flow, Demand, and Pressure-Demand Types)

The demand type produces a negative pressure in the face piece on inhalation, whereas continuous-flow and pressure-demand types maintain a positive pressure in the respiratory-inlet covering and are less apt to permit inward leakage of contaminants.

Air-line suits may protect against atmosphere that irritate the skin or that may be absorbed through unbroken skin.

1.5.A LIMITATIONS

Air-line respirators provide no protection if the air supply fails. Some contaminants, such as tritium, may penetrate the material of an air-line suit and limit its effectiveness.

Other contaminants, such as fluorine, may react chemically with the material on an air-line suit and damage it.

1.5.B COMBINATION AIR-LINE RESPIRATORS WITH AUXILIARY SC AIR SUPPLY

The advantages and disadvantaged, expresses above, of the mode of operation being used will govern. The mode with greater limitations (air-purifying mode) will mainly determine the overall capabilities and limitation of the respirator, since the wearer may for some reason fail to change the mode of operation even though conditions would require such a change.

2.0 AIR-PURIFYING RESPIRATORS

2.1 GENERAL LIMITATIONS

Air purifying respirators do not protect against oxygen-deficient atmospheres, nor against skin irritations by, or sorption through the skin, of airborne contaminants.

The maximum contaminant concentration against which an air-purifying respirator will protect is determined by the design efficiency and capacity of the cartridge, canister, or filter, and face piece-to-face seal on the user. For gases and vapors, the maximum concentration for which the air-purifying element is designated is specified by the manufacturer or is listed on labels of cartridges and canisters.

Non-powered air purifying will not provide the maximum design protection specified unless the face piece or mouth piece/nose clamp is carefully fitted to the wearer's face to prevent inward leakage (See 8.1). The time period over which protection is provided is dependent on canister, cartridge, or filter type; concentration of contaminant; humidity levels in the ambient atmosphere; and the wearer's respiratory rate.

The proper type of canister, cartridge, or filter must be selected for the particular atmosphere and conditions. Non-powered air-purifying respirators may cause discomfort, due to noticeable resistance to inhalation. This problem is minimized in powered respirators. Respirators face piece present special problems to individual required to wear prescription lenses (See 9.1). These devices do have the advantage of being small, light, and simple in operation.

Use of air-purifying respirators in atmosphere immediately dangerous to life or health is limited to specific devices under specific conditions.

2.2 VAPOR AND GAS-REMOVING RESPIRATORS

2.2.A LIMITATIONS

No protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas vapor is being removed from the inspired air.

An uncomfortably high temperature indicates a high concentration of gas or vapor and requires and immediate return to fresh air.

Use should be avoided in atmosphere where the contaminant(s) lacks sufficient warning properties (that is: odor, taste, or irritation at a concentration in air at or above the (permissible exposure limit). Vapor-and-gas-removing respirators are not approved for contaminants that lack adequate warning properties.

Not for use in atmospheres immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions (See Table 5).

- Full Face Piece Respirator provides protection against eye irritation, in addition to respiratory protection.

- Quarter-mask and Half-mask Face Piece Respirator provides a fabric covering (face let) available from some manufacturers shall not be used.

- Mouth Piece Respirator shall be used only for escape applications. Mouth breathing detection of contaminant by odor. Nose clamps must be securely in place to prevent nasal breathing.

- Limitations include no protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air.

3.0 PARTICULATE-REMOVING RESPIRATORS

3.1 LIMITATIONS

Protection against non-volatile particles only. No protection against gases and vapors.

Not for use in atmosphere immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions.

3.1.A FULL FACE PIECE RESPIRATOR

Provide protection against eye irritation, in addition to respiratory protection.

3.1.B QUARTER-MASK AND HALF-MASK FACE PIECE RESPIRATOR

A fabric covering (facelet) available from some manufacturers shall not be used unless approved for use with respirator.

3.1.C MOUTH PIECE RESPIRATOR

Shall be used only for escape application. Mouth breathing prevents detection of contaminant by odor. Nose clamp must be securely in place to prevent nasal breathing.

3.2 COMBINATION PARTICULATE-AND-VAPOR-AND-GAS REMOVING RESPIRATORS

The advantages and disadvantages of the component sections of the combinations respirator as described above apply.

EXHIBIT 3

PROCEDURES FOR CONDUCTING A QUALITATIVE FIT-TEST

1.0 SMOKE TEST

1.1 RESPIRATOR SELECTION

1.1.A The test subject should be allowed to select the most comfortable respirator from any array of various sizes and manufacturers that includes at least three sizes and units of at least two manufacturers.

1.1.B The selection process should be conducted in an area away from the fit-test area to prevent odor fatigue. Prior to the selection process, the test subject should be shown how to put on a respirator, how it should be positioned on the face, and how to set strap tension.

1.2 SELECT THE TEST AGENT

1.2.A One of the two test agents, isoamyl acetate, or saccharin solution should now be selected.

1.3 CONDUCTING THE FIT-TEST

1.3.A Have the test subject properly don the selected respirator and tighten the tension straps to get a good face piece-to-face seal.

1.3.B At this point, have the test subject "seat" the mask by rapidly moving the head from side-to-side and up and down while taking a few deep breaths.

1.3.C The test subject should now conduct the positive and/or negative pressure test. If the positive and/or negative pressure test is not satisfactory, the selected respirator should be discarded at this point, and an alternate respirator selected and tested.

1.3.D If the positive and/or negative pressure was satisfactory, the test subject is ready for the fit-test.

1.3.E Allow the test subject to wear the respirator for approximately 8 to 10 minutes before continuing with the fit-test. During this time, review the test procedures with the test subject.

1.3.F Break both ends of a ventilation smoke tube. Attach a short length of tubing to one end of the smoke tube and low pressure air pump or squeeze the bulb and force out of the tube.

1.3.G Direct the stream of smoke from the tube towards the face seal area of the test

subject, beginning at least 12 inches from the face piece and gradually moving to within 1 inch, moving around the whole perimeter of the mask.

1.3.H Instruct the test subject to conduct the following exercise while respirator seal is being challenged by the smoke. Each exercise should be performed fro at least one minute.

1. Breathing normally

2. Breathing deeply. Be certain the breaths are deep and regular.

3. Turn the head from side-to-side. Be certain the movements are complete and that the test subject is inhaling when his/her head is at either side.

4. Nod the head up and down. Be certain the motions are complete. Have the test subject inhale when his/her head is at either side.

5. Have the test subject jog in place for a few seconds.

1.3.I When the test subject has passed the smoke test without evidence of a response, the respirator should be removed and the test subject is given a sensitivity check of the smoke from the same tube to determine whether he/she reacts to the smoke. Failure to evoke a response will void the whole fit-test.

1.4 SEMI-ANNUAL TESTING

The qualitative fit-test should be repeated at least once more every six months, if the user is assigned a new respirator, or whenever one or more of the following occur:

1.4.A The employee has a weight change of 20 pounds or more;

1.4.B Facial scaring occurs in an area of the face seal;

1.4.C The employee has significant dental changes;

1.4.D The employee has reconstruction or cosmetic surgery of the face; and,

1.4.E Any other condition that may interfere with the face piece seal.

1.5 RECORD KEEPING

The Respirator Test Summary, shown in Exhibit 4, must be completed after each fit-test.

EXHIBIT 4

RESPIRATOR FIT-TEST AND TRAINING RECORD

Employee's Name: _____ Social Security No.:_____-_____-_____

Project Name: _____ Job Number: _____

RESPIRATOR FIT-TEST SUMMARY (*Must be conducted for each negative pressure respirator used*)

Fit-Test Date: _____ Person Conducting Fit-Test: _____

Respirator Selected:

Manufacturer: _____ Model: _____
Respirator Size: _____ NIOSH Approval No.: _____
Was Rainbow Passage Used: ___ Yes ___ No Was Face piece-to-face Seal Obtained: ___ Yes ___ No

Signature of person conducting Fit-Test: _____
_____

RESPIRATOR TRAINING RECORD

Your signature on the respirator Training Record will attest to your having received and understood the following respirator training information which OSHA requires as part of their Respiratory Protection Program.

The required respirator training consists of the following:

- ☐ An explanation of the problems involved in misusing or inter-changing parts of the respirator.
- ☐ A discussion of why engineering controls could not prevent the use of respiratory protection.
- ☐ How and why this make and model was chosen for this specific project.
- ☐ The limitations of this make and model was chosen for this specific project.
- ☐ How to put on this respirator and properly adjust the face piece and tension straps.
- ☐ How to wear this respirator properly.
- ☐ What the essential points of the care and maintenance of this respirator are.
- ☐ How to recognize and handle emergencies which may occur while using this respirator.
- ☐ How to properly inspect, clean, and disinfect this respirator.
- ☐ How to properly use an Air Purifying Respirator.
- ☐ When a Type-C Supplied-air respirator is required.
- ☐ The purpose of medical evaluation.
- ☐ How to conduct a proper respirator fit-test.
- ☐ That a Powered Air Purifying Respirator (PAPR) is available to you upon request, as long as it meets the protection factor for the hazard involved.

Employee's Signature: _____ Date: _____

EXHIBIT 4

QUALITATIVE RESPIRATOR FIT TESTING

Date: _____

Employee Name: _____ (Last, First, Middle Intl.)

Age: _____ Sex: _____

Years Experience: _____ Frequency: _____ **See Key

Mask Now Using: _____ Usual Conditions: _____ **See Key

Mask Selected: _____ (i.e., MSA, Half Mask, Medium)

Qualitative Tests: (PP) _____ (NP) _____ (IA) _____ (IS) _____

(1) = Passed (2) = Failed (3) = Did Not Run

IAA Sensitivity Test: _____ (Pass) or (Fail)

Smoke Sensitivity Test: _____ (Pass) or (Fail)

Respirator Selection: 1st Choice: _____ (Pass) or (Fail)

2nd Choice: _____ (Pass) or (Fail)

3rd Choice: _____ (Pass) or (Fail)

Final Selection: _____ (Pass) or (Fail)
(Manufacturer/Size)

Test Instructor: _____ Employee Signature: _____

Comments: Facial Conditions:

( ) Wrinkles	( ) Wide-Bridge
( ) Broken Nose	( ) Shallow-Bridge
( ) Deep Nostrils	( ) Small Face
( ) Narrow Face	( ) Wide Face
( ) Other	

Frequency:
How many times used during a week:
(1) Less than 1/Week
(2) 2-5 Times/Week
(3) 5-10 Times/Week
(4) 1-4 Times/Day

Usual Conditions:
(1) Beard/Heavy
(2) Beard/Light
(3) Scars
(4) Wrinkles
(5) Glasses
(6) Several Days Beard Growth

Qualitative Tests:
PP - Positive Pressure
NP - Negative Pressure
IA - Isoamyl Acetal
IS - Irritant Smoke

EXHIBIT 5

RESPIRATOR INSPECTION CHART

Item	Half Face APR	Full Face APR	PAPR	Type C	SCBA
FACE PIECE					
Dirt or debris	X	X	X	X	X
Cracks, tears or holes	X	X	X	X	X
Distortion	X	X	X	X	X
Cracked or scratched lens		X	X	X	X
Looseness of parts	X	X	X	X	X
HEAD STRAPS					
Break or tears	X	X	X	X	X
Loss of elasticity	X	X	X	X	X
Broken or malfunctioning buckles	X	X	X	X	X
VALVES					
Dirt or dust	X	X	X	X	X
Detergent residue	X	X	X	X	X
Distortion	X	X	X	X	X
Missing Pieces	X	X	X	X	X
Fit of valve set	X	X	X	X	X
FILTER/CARTRIDGES					
Proper one for intended use	X	X	X	X	X
Approval designation	X	X	X	X	X
Missing or worn gasket	X	X	X	X	X
Worn threads on filter	X	X	X	X	X
Worn threads on face piece	X	X	X	X	X
Cracks or dents	X	X	X		X
Missing or loose hose clamps	X	X	X		X

Item	Half Face APR	Full Face APR	PAPR	Type C	SCBA
COMPRESSORS					
Air Quality				X	
Breaks or kinks in supply hose				X	
Supply hose fittings				X	
Connections				X	
Regulator set properly and working				X	
Valves working correctly				X	
Carbon monoxide alarms				X	
High Temperature alarm				X	
Air-purifying elements					
TANKS					
Regulator					X
Valves					X
Reserves air system					X
Harness					X
PUMPS					
Motors			X		
Charging units			X		
Hoses			X		
Batteries			X		
Test gauges			X		
Power cords			X		
Belt holder			X		

APPENDIX D

PERSONNEL DECONTAMINATION PROCEDURES

APPENDIX D-1

LEVEL D DECONTAMINATION

- Scrub outer boots and gloves with soap and water.
- Rinse off soapy water from boots and gloves with clean water.
- Remove outer gloves and dispose in container or store in decon zone for later use.
- Wash hands and face as soon as possible.
- Equipment - 30 gallon tub
  soapy water
  fresh water
  long handle brush
  garbage can with plastic linear

APPENDIX D-2

LEVEL C DECONTAMINATION

- Deposit equipment used on-site (tools, sampling devices, and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different designated containers with plastic liners.

- Scrub outer boots and gloves with decon solution or detergent/water.

- Rinse off decon solution using copious amounts of water. Repeat as many times as necessary.

- Remove tape around boots and gloves and deposit in container with plastic liner.

- Remove boot covers and deposit in container with plastic liner.

- Remove outer gloves and deposit in container with plastic liner.

- Remove disposable suit. Deposit in container with plastic liner.

- Remove face piece. Avoid touching face with gloves. Wash respirator with spray cleaner and paper towels, and store in plastic liner.

- Remove inner gloves and deposit in container with plastic liner.

- Wash hands and face as soon as possible.

- Equipment - container (20-30 gallons)
  decon solution or detergent/water
  long handle, soft bristle scrub brushes
  container (30-50 gallons) or spray unit
  clean water
  plastic liners

APPENDIX D-3

LEVEL B DECONTAMINATION

- Deposit equipment used on-site (tools, sampling devices, and containers, monitoring instruments, radios, clipboards, etc.) On plastic drop cloths or in different designated containers with plastic liners.
- Scrub outer boots and gloves with decon solution or detergent/water.
- Rinse off decon solution using copious amounts of water. Repeat as many times as necessary.
- Remove tape around boots and gloves and deposit in container with plastic liner.
- Remove boot covers and deposit in container with plastic liner.
- Remove outer gloves and deposit in container with plastic liner.
- Remove SCBA back pack / air line harness and wash with a spray cleaner, paper towels and store in plastic liner.
- Remove disposable suit. Deposit in container with plastic liner.
- Remove face piece. Avoid touching face with gloves. Wash respirator with spray cleaner and paper towels, and store in plastic liner.
- Remove inner gloves and deposit in container with plastic liner.
- Wash hands and face as soon as possible.
- Equipment - container (20-30 gallons)
  decon solution or detergent/water
  long handle, soft bristle scrub brushes
  container (30-50 gallons) or spray unit
  clean water
  plastic liners

APPENDIX E

WASTE MANAGEMENT AND SPILL CONTROL PLAN

WASTE MANAGEMENT
AND SPILL CONTROL PLAN

Hazardous Waste Management Procedures are prepared in writing on a site specific basis by the Project Manager/Competent Person.

The following list of topics can be used by the competent person as a guide in the preparation of the site specific plan. Additionally, the competent person will also consult with the LiRo procedures for Hazard Communication Standard, Respiratory Protection, and personal protective equipment Sections.

1. Obtain SDS for each waste encountered. Follow all safety precautions, personal protective equipment, handling procedures, and training as detailed on the SDS.

2. Refer to OSHA Regulations, TSCA, RCRA and CRCLA Regulations for laws governing the handling/disposal of specific types of hazardous substances.

3. Follow the Site Specific Safety and Health Plan for handling hazardous waste. Use only certified/trained/authorized personnel to handle hazardous waste.

4. Utilize the proper drums/containers for the specific waste encountered. Refer to 40 CFR 260-272 and 300 and DOT Regulations 49 CFR Parts 171-178.

5. Provide sufficient quantity of the proper labels, and ID tags to identify the wastes in the containers. Use appropriate warning signs around the on-site staging area.

6. Maintain a suitable quantity of absorbent materials and fire extinguishers in event of a spill, leak, or discharge. The emergency spill materials shall be located in close proximity to the staging area.

7. The staging area shall include a "secondary containment" around the drums/containers.

8. Drums/containers shall be stored in a neat and orderly manner. Containers shall be segregated by waste type. Do not co-mingle waste on site.

9. The generation of hazardous waste shall be minimized. Care shall be taken to not cross-contaminate waste on site.

10. Do not overfill or overpack a given container beyond its rated capacity. Allow for expansion/contraction due to freeze/thaw temperature changes. Do not overload roll-off, gondolas, or railroad cars.

11. A written log with the date and quantity of waste generated on site shall be kept by the Project Foreman/Competent Person.

12. The Site Specific Hazardous Waste Management Procedures shall be covered at the

Weekly/Daily Tool Box Talks held on site with all employees who may be near or handling the waste on site. Each employee shall acknowledge their understanding of the procedures by signing the tool box talk meeting minutes. Copies of procedures shall be posted on site and readily available personnel.

The transportation and disposal of hazardous waste from a LiRo environmental remediation project is performed only through licensed, certified, trained and permitted 3rd party subcontractors.

The following guide is used to insure the use of qualified subcontractor to be used for the disposition of hazardous wastes:

1. Obtain copies of all waste characterization reports from a qualified/licensed laboratory.

2. Obtain copies of all permits for both the waste transporters and the Treatment, Storage, and Disposal Facility (T.S.D.F.) (Make sure the waste being disposed of is on their permit and their permits have not expired).

3. Obtain written approval from the T.S.D.S. to accept the waste.

4. Obtain a certificate of insurance for General Liability, Workman's Comp, and auto for each transporter and T.S.D.F. LiRo is to be named additional insured on all policies/certificates. All original certificates are to be sent to LiRo Engineer's main office.

5. Fill out the Waste Manifest Transport/Disposal Form provided by the T.S.D.F. Obtain signatures from the generator prior to shipment (in no case shall LiRo act or sign on behalf of the generator of hazardous waste).

6. A Summary Log showing the date, transporter, T.S.D.F, quantity and waste type shall be maintained at the site for future reference and tracking.

SPILL CONTROL & CONTINGENCY PLAN

The Spill Control & Contingency Plan (SCP) details procedures for the diking/berming of contaminated liquid and/or fuel storage areas; the development of operating procedures to include spill prevention design; and the training of employees in spill prevention and control techniques.

In the event of a spill, the following spill response procedures should be implemented:

1. *First aid will be administered to injured/contaminated persons.* Any on-site personnel observing a spill will act immediately to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures who are familiar with spill control and cleanup.

2. *Warn unsuspecting persons/vehicles of the hazard.* On-site personnel will act to prevent any unexpecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other on-site personnel who are familiar with spill control and cleanup.

3. *Stop the spill at the source, if possible.* Without taking unnecessary risks, on-site personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve, or temporarily sealing a hole with a plug.

4. *Notify the Project Manager/Competent Person.* Utilizing available radio communications or other rapid communication procedures. The Project Manager will be notified of the spill, including information on material spilled, quantity, personnel injuries, and immediate life-threatening hazards.

5. *Spill assessment and primary containment.* The competent person will make rapid assessment of the spill and direct primary containment measures. Depending upon the nature of the spill, primary containment measures may include, but are not limited to:

    - Constructing a temporary berm to control the horizontal flow of the spill using absorption pads, booms, sandbags, or inert material.

    - Placing drums under the leak to collect the spilling material before it flows over the ground.

    - Transferring the material from its original container to another container.

6. *Notify the Customer.*

7. *Spill cleanup procedure.* On-site personnel will develop a spill cleanup procedure taking into consideration associated hazards, and quantity of spilled material.

8. *Spill cleanup inspection.* The Project Manager and customer will jointly inspect the spill

to determine that the spill has been cleaned up to the satisfaction of the client.

9. Any spill greater than or equal to 5-gallons in size to surface water or sewer must be reported to the NYSDEC within 2 hours of occurrence.

A Spill Report Form must be completed by the Project Manager, and submitted to the Management within 24 hours of the incident.

EMISSION - SPILL - DISCHARGE REPORT

Job: _____ Date/Time: _____

Location: _____

Superintendent: _____

This form must be completed if any spill occurs on company or customer premises.

Substance(s) Spilled/Discharged:
Actions Taken to Control Spill/Discharge:
Amount Spilled/Discharged:

Reported By:
Report Reviewed By:
Date Report Sent to Owner:
Names of Persons Receiving Report:

APPENDIX F

JOB HAZARD ASSESSMENTS

Job Hazard Analysis: Phase II - Drilling Oversight/Environmental Sampling

Project Name:	Project ID #:	Conducted by:
MAJOR STEPS/HAZARDS	**POTENTIAL HAZARDS**	**PROTECTIVE MEASURES/CONTROLS**
Step 1: Layout boring locations	Foot & Hand Injury	Wear ANSI approved safety shoes to protect feet and protective gloves to protect hand.
	Head Injury	Wear ANSI approved hard hat to protect head from falling or moving objects.
	Eye Injury	Wear ANSI approved safety glasses to protect eyes from flying particles.
	Vehicular traffic	Wear high visibility ANSI approved reflective clothing. Adhere to site specific traffic control plan.
	Slip/Trips/Falls	Maintain work areas safe and orderly and practice good housekeeping; keep tools away from pedestrian traffic areas; ensure barriers and signs are in place.
Step 2: Clearing boring locations/Sampling	Noise	Wear ear muffs or plugs.
	Foot & Hand Injury	Wear ANSI approved safety shoes to protect feet and protective gloves to protect hand.
	Head Injury	Wear ANSI approved hard hat to protect head from falling or moving objects.
	Eye Injury	Wear ANSI approved safety glasses to protect eyes from flying particles.
	Hand and Power Tools	Daily inspections will be performed by the user; remove broken or damaged tools from service; use the tool for its intended purpose; use in accordance with manufacturer's instructions.
	Hand-Arm Vibration	Wear thick gloves; use vibrating tools for no more than 20-minutes at a time.
	Contaminated Media Exposure	Screen breathing zone for organic vapors using PID; wear chemical resistant outer gloves of latex or nitrile; upgrade PEP if required by site conditions/screening results.
	Vehicles/Heavy Equipment	Be alert of your surroundings; back-up alarm on equipment; use spotter; wear high visibility reflective vests; and, inspect vehicles/equipment.
	Hitting Utility (gas, electric, steam, water)	Perform One Call and confirm all utilities have been clearly marked. Daylight using vacuum excavator prior to drilling.
	Slip/Trips/Falls	Maintain work areas safe and orderly and practice good housekeeping; keep tools away from pedestrian traffic areas; ensure barriers and signs are in place.
Step 3: Advance borings/Sampling	Noise	Wear ear muffs or plugs.
	Foot & Hand Injury	Wear ANSI approved safety shoes to protect feet and protective gloves to protect hand.
	Head Injury	Wear ANSI approved hard hat to protect head from falling or moving objects.
	Eye Injury	Wear ANSI approved safety glasses to protect eyes from flying particles.
	Vehicles/Heavy Equipment	Be alert of your surroundings; back-up alarm on equipment; use spotter; wear high visibility reflective vests; inspect vehicles/equipment; level equipment accordingly; only one designated signalman at any time; review and use standard signals; use only trained, experienced, and certified (if applicable) operators.
	Hand-Arm Vibration	Wear thick gloves; use vibrating tools for no more than 20-minutes at a time.
	Manual Lifting	Site personnel are instructed on proper lifting techniques; use proper lifting techniques; use team lifting for heavy objects; avoid twisting with a load.
	Contaminated Media Exposure	Screen breathing zone for organic vapors using PAD; wear chemical resistant outer gloves of latex or nitrile; upgrade PPE if required by site conditions/screening results.
	Moving Parts	Keep hands, body, and feet away from rotating parts to prevent entanglement.
	Hitting Utility (gas, electric, steam, water)	Perform One Call and confirm all utilities have been clearly marked. Daylight using vacuum excavator prior to drilling.
	Slip/Trips/Falls	Maintain work areas safe and orderly and practice good housekeeping; keep tools away from pedestrian traffic areas; ensure barriers and signs are in place.
Step 4: Site Cleanup	Foot & Hand Injury	Wear ANSI approved safety shoes to protect feet and protective gloves to protect hand.
	Head Injury	Wear ANSI approved hard hat to protect head from falling or moving objects.
	Eye Injury	Wear ANSI approved safety glasses to protect eyes from flying particles.
	Vehicular traffic	Wear high visibility ANSI approved reflective clothing. Adhere to site specific traffic control plan.
	Slip/Trips/Falls	Maintain work areas safe and orderly and practice good housekeeping; keep tools away from pedestrian traffic areas; ensure barriers and signs are in place.
General Hazards	Cold Stress	Wear insulated clothing and gloves that have thermal protection; monitor air temperature and wind chill factors during the course of the operation; breaks should be taken accordingly.

MAJOR STEPS/HAZARDS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
General Hazards	Heat Stress	Drink plenty of fluids; train personnel of signs/symptoms of heat stress; monitor air temperature.
	Vehicular traffic	Wear high visibility ANSI approved reflective clothing. Adhere to site specific traffic control plan.
	Slip/Trips/Falls	Maintain work areas safe and orderly and practice good housekeeping; keep drill rig tooling away from pedestrian traffic areas.
	Sunburn	Wear broad rim hat or use sun block of at least SPF 40.
	Ingestion/Inhalation of Materials	Wash hands thoroughly before eating and drinking. Smoking is prohibited.

Equipment Required to do this job:

Hard hat, safety glasses, steel toed boots, gloves, hearing protection, work vest, fire extinguisher, caution tape/barriers/barricades.

COMPANY NAME	PROJECT ID	LOCATION	
JOB HAZARD ANALYSIS (JHA) **Trenching/ Excavation**	**NAME OF ANALYST**	**JOB TITLE**	**DATE PREPARED**
TASKS/PROCEDURES	**HAZARDS**	**HAZARD CONTROL MEASURES** **Engineering Controls * Substitution * Administrative Controls * PPE**	
Excavation/Trenching	Obstructions to Trenching	Prior to excavation, check trenching path for obstructions.	
	Equipment in Unsafe Operating Condition	Thoroughly inspect equipment before use. Make sure all safety devices and guards are intact and operable.	
	Damaging Buried Utilities	Call 811 (NY 1 Call Center) for utility mark outs and ensure locates are in place prior to commencement of work. Check for private buried lines that would not be identified through Call Center mark outs. If contact is made with energized equipment while operating, jump from equipment (do not step off) with both feet. Clear and secure the work zone, contact the appropriate personnel.	
	Toxic Material in Ground	Be aware of unusual odors and ground color while excavating.	
	Injury From Working in Excavation	Wear proper PPE (Level D) including hard hat, protective glasses or goggles, safety work shoes, reflective or highly visible vest, work gloves, long sleeve shirts, long pants, hard hats, and ear plugs if needed. Hazardous materials are not anticipated in the work area; therefore, an upgrade in the PPE Level will not be required. Continuous monitoring of the atmosphere with an MSA Altair 4x Multi-gas Detector will be used to make sure vapors are not collecting on the ground at unsafe levels. Dust will be controlled and kept to a minimum by spraying the area with clean water. A minimum amount of water will be used to keep the dust under control. A dust mask will be worn during the wetting down process.	

TASKS/PROCEDURES	HAZARDS	HAZARD CONTROL MEASURES Engineering Controls * Substitution * Administrative Controls * PPE
Excavation/Trenching	Fall Protection	Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge is 6 feet (1.8m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems or personal fall arrest systems.
Operating Excavating Equipment	Equipment Tipping Over, Overloading	Check the angle limits of the equipment and operate well below them. Know the limits of the machinery and operate well within them. Call for a backhoe or other equipment if in doubt.
	Struck by or Caught in Equipment	Watch for swinging buckets, stay clear of trenching blades, and make sure operator of machine is aware of your presence if on the ground.
Working Inside Trenches & Excavations	Cave-ins, Unstable Trench Walls	Use shoring, sloping or shielding per OSHA standards for all excavations 4 feet deep or greater. Never enter any excavation if you feel the dirt is unstable.
Working Inside Trenches & Excavations	No Egress or Unsafe Egress From Excavation	Ladders must be accessible within 25 feet either direction of travel in all trances 4 feet deep or greater. Use ladders when depth gets below standard stepping height.
General Items Before Leaving Job Site	Open Pits Trenches Public or Employees Exposed to Falling In	Secure all open pits and trenches with caution tape, plywood or barricades before leaving job.
	Messy or Unsafe Work Site-Looks Bad for Company & Unsafe for Public	Restore property to its original condition to the best of your ability.
	Debris Falling from Vehicles or Trailer While Traveling on Road	Clear all mud and debris from equipment and trailer, secure all material before exiting the job.
Analyst Signature		

COMPANY NAME	PROJECT ID	LOCATION	
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Analyst Signature		

Appendix B Phase II Environmental Subsurface Investigation Report

- Final -

Phase II Environmental Site Investigation Report

For

Newtown Creek Nature Walk Phase 3

329 Greenpoint Avenue

Brooklyn, New York

DDC PROJECT NO. NC-61A

WORK ORDER NO. 11876-LIRO-3-10854

CONTRACT REGISTRATION NO. 20151405569

Prepared for:

NYC DDC Department of Design and Construction

Bureau of Environmental and Geotechnical Services

30-30 Thomson Avenue, Third Floor

Long Island City, New York 11101

Prepared by:

LiRo Engineers, Inc.

703 Lorimer Street

Brooklyn, New York 11211

PROJECT NO. 15-008-0265

November 30, 2016

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EXECUTIVE SUMMARY

On behalf of the New York City Department of Design and Construction (NYCDDC), LiRo Engineers, Inc. (LiRo) conducted a Phase II Environmental Site Investigation (ESI) of the NC-61A Site located at 329 Greenpoint Avenue (the "Site"). The Site is located in the Greenpoint neighborhood of Brooklyn, New York. Excavation for the construction of the Newtown Creek Nature Walk Phase 3, which will consist of a waterfront park including boundary walls and fences with lockable pedestrian and vehicular gateways, parking, a shade structure, fixed seating and tables, planted areas, lighting, and signage, is proposed for the Site. Nature Walk Phase 3 design also includes provisions to maintain access to the New York City Department of Environmental Protection (NYCDEP) Floatables Collection Facility that presently exist along the eastern side of Whale Creek Canal. The proposed Nature Walk Site has been subject to City Environmental Quality Review (CEQR) and a CEQR negative declaration was issued on February 17, 2016. The Phase II ESI was conducted to determine if the Site's environmental condition will impact proposed construction activities.

The Site consists of a vacant lot approximately 430 feet long by 70 feet wide (approximately 0.7-acre area) and is bounded by the intersection of North Henry Street and Kingsland Avenue to the east, Whale Creek to the west, Newtown Creek Wastewater Treatment Plant to the south, and the former Department of Sanitation (DSNY) to the north. The Site is situated in an area characterized by predominantly industrial uses.

The Phase II ESI was completed to assess if potential environmental concerns exist that may impact subsurface conditions at the Site.

To assess the Site, LiRo completed a subsurface investigation on October 24 and 25, 2016, which included the following:

- The advancement of one (1) boring (SB-01) to a terminal depth of approximately 6 feet below grade (ftbg), a second boring to a terminal depth of approximately 15 ftbg (SB-02), and a third boring to a terminal depth of approximately 5 ftbg (SB-03) due to refusal;
- Field screening of soil samples, including photo-ionization detector (PID) readings and visual and olfactory indicators of contamination (staining, odors);
- The collection of four (4) grab soil samples which were analyzed for the following parameters: (1) United States Environmental Protection Agency (USEPA) Target Compound List (TCL) volatile organic compounds (VOCs); (2) USEPA TCL semi-volatile organic compounds (SVOCs); (3) TCL polychlorinated biphenyls (PCBs); (4) USEPA pesticides; and, (5) USEPA Target Analyte List (TAL) metals;
- The collection of three (3) composite soil samples which were analyzed for the following parameters: (1) Total Petroleum Hydrocarbon Diesel Range Organics/Gasoline Range Organics (TPHC DRO/GRO); (2) Resource Conservation and Recovery Act (RCRA) Characteristics; and, (3) Toxicity Characteristic Leaching Procedure (TCLP) RCRA Metals;

- The installation of one (1) temporary well point (TWP) within soil boring SB-02, the collection of one (1) groundwater sample from the TWP, and the laboratory analyses of this sample for the following parameters: (1) USEPA TCL VOCs; (2) USEPA TCL SVOCs; (3) TCL PCBs; (4) USEPA pesticides; (5) USEPA TAL metals (filtered and unfiltered); and, (6) New York City Department of Environmental Protection (NYCDEP) Limitations for Effluent to Sanitary or Combined Sewers (NYCDEP Sewer Discharge Criteria);
- The soil and groundwater samples collected as part of this Phase II ESI were collected to comply with the NYCDEP CEQR protocols;
- Soil and groundwater Quality Control/Quality Assurance (QA/QC) samples were also collected to comply with the NYCDEP CEQR protocols and submitted for analysis; and,
- The preparation of this report, which includes tables summarizing the laboratory analytical results and figures depicting boring locations, significant site features and, if applicable, contamination occurrence and distribution.

In order to evaluate the subsurface soil and groundwater quality, laboratory analytical results were compared with the regulatory standards identified in (1) New York State Department of Environmental Conservation (NYSDEC) Subpart 375-6: Remedial Program Unrestricted and Restricted Use (Track 1 and Track 2) Soil Cleanup Objectives (SCOs); (2) NYSDEC CP-51 Soil Cleanup Levels (SCLs) which include Supplemental Soil Cleanup Objectives (SSCOs) to NYSDEC Subpart 375-6 and SCLs for gasoline/fuel oil contaminated soil; and/or, (3) Toxicity Characteristic Regulatory Levels for Hazardous Waste published in RCRA and 6 New York Codes, Rules and Regulations (NYCRR) Part 371. In order to evaluate the groundwater quality, the laboratory analytical results for the groundwater sample was compared to the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards (Class GA groundwater) and Guidance Values (AWQSGVs) and Groundwater Effluent Limitations and the NYCDEP Sewer Discharge Criteria.

The subsurface soils encountered during this Phase II ESI consisted predominantly of dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg in at least SB-02. The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13-15 ftbg. Groundwater was encountered within two (2) of the borings at depths ranging from 4 (in SB-03) to 9 ftbg (SB-02). Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.

Field screening (i.e., PID readings and visual and olfactory observations) did not identify impacted soils at the Site.

VOCs, including acetone, bromochloromethane, carbon disulfide, chloroform, ethylbenzene, isopropyl benzene, methylene chloride, o-xylene, tetrachloroethene, trichloroethene, and/or xylene (mixed), were detected in all four (4) grab samples collected at concentrations below the Unrestricted Use (Track 1) SCO, Restricted Use (Track 2) SCOs, and CP-51 SCLs. Acetone and methylene chloride are common laboratory cross contaminants and are most likely not representative of subsurface conditions. SVOCs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k) fluoranthene, chrysene, and/or indeno(1,2,3-cd)pyrene, were

detected in all four (4) grab samples collected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs. The detected SVOCs may be attributed to: (a) residuals from isolated releases in the area of the Site; and/or, (b) the presence of historic fill material placed at the Site. TAL metals, including arsenic, chromium (total), copper, iron, lead, mercury, nickel, selenium, and/or zinc, were detected in all four (4) grab samples collected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs. The reported concentrations are likely attributed to background levels and/or historic fill material placed at the Site. One (1) pesticide, 4,4'-DDE, was detected in one (1) of the four (4) grab samples collected (SB-03-3.5-4) at a concentration exceeding the corresponding Unrestricted Use (Track 1) SCO. One (1) PCB, Aroclor 1260, was detected in two (2) of the four (4) grab samples collected (SB-01-5.5-6 and SB-02-0-2) below the corresponding Unrestricted Use (Track 1) SCO and Restricted Use (Track 2) SCO.

Ignitability (flash point), reactivity (cyanide and sulfide), and corrosivity (pH) were within the acceptable RCRA ranges in all three (3) composite samples collected. TCLP RCRA metals were not detected at concentrations exceeding RCRA limits in the three (3) waste characterization soil samples collected. TPHC-DRO were detected at concentrations ranging from 35 to 81 milligrams per kilograms (mg/kg) in all three (3) samples (SB-01-COMP, SB-02-COMP, and SB-03-COMP). TPHC-GRO were not detected in any of the three (3) composite samples collected. There are no regulatory standards for TPHC-DRO and TPHC-GRO. Analytical results will need to be compared to levels acceptable by the chosen receiving facility to determine appropriate waste characterization prior to off-site disposal.

The one (1) groundwater sample (TWP-02) was analyzed for the parameters required by the NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (Daily Limit). All parameters were within NYCDEP Sewer Discharge Criteria.

One (1) VOC, carbon disulfide, was detected in the groundwater sample collected at a concentration below the NYCDEP Sewer Discharge Criteria and/or TOGS 1.1.1 AWQSGV. One (1) SVOC, dimethyl phthalate, was detected in the groundwater sample collected at a concentration below the NYCDEP Sewer Discharge Criteria and/or TOGS 1.1.1 AWQSGV. TAL metals (unfiltered), including arsenic, iron, lead, magnesium, manganese, and sodium, were detected in the groundwater sample collected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. TAL metals (filtered/dissolved), including arsenic, iron, magnesium, manganese, and sodium, were also detected in the groundwater sample collected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. Pesticides and PCBs were not detected in the groundwater sample collected.

One (1) duplicate soil sample was collected from SB-02 and that a total of four (4) grab samples were collected (SB-01, SB-02 (two (2) samples), and SB-03) and analyzed for VOCs, SVOCs, metals, pesticides, and PCBs. The results for the duplicate sample were generally consistent with the primary soil sample. One (1) duplicate groundwater sample was collected from TWP-02 (SB-02) and analyzed for VOCs, SVOCs, metals, pesticides, and PCBs. The results for this duplicate sample were generally consistent with those detected within the primary TWP-02 (SB-

02) groundwater sample. One (1) equipment blank sample was collected during the subsurface investigation. Based on the analytical results of this sample, no VOCs, SVOCs, metals, pesticides, or PCBs exceedances were detected. No VOCs were reported within the one (1) trip blank sample submitted for analysis.

Conclusions

Based on the results of the Phase II ESI, the following conclusions are made:

- Field screening (i.e., PID readings and visual and olfactory observations) did not identify impacted soils within the Site.
- The Site is underlain by dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg in at least SB-02. The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13-15 ftbg. Groundwater was encountered within two (2) of the borings at depths ranging from 4 (SB-03) to 9 ftbg (SB-02). Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.
- Subsurface soils contain elevated concentrations of SVOCs, metals, pesticides, and TPHC DRO that exceed the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).
- Concentrations of metals (filtered and unfiltered/dissolved) were detected at concentrations above the State Groundwater quality standards and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).
- The groundwater at the Site meets the NYCDEP Sewer Discharge Criteria for sanitary or combined sewers.
- The subsurface soil samples and groundwater collected from the Site are non-hazardous based on waste characterization testing.

Recommendations

For the Site to be suitable for proposed development, the following measures are recommended:

- Based on the SVOCs, metals, pesticides, and TPHC DRO contamination identified during the investigation, the Contract documents should identify provisions and a contingency for managing, handling, transporting and disposing of such soils. The Contractor should be required to submit a Material Handling Plan to identify the specific protocol and procedures that will be employed to manage the waste in accordance with applicable regulations.
- It is expected that after the proposed Nature Walk Phase 3 is constructed, there will be no exposed soil left at the Site. The landscaped areas incorporated into the development of the Site should include a minimum 24 inch thick certified clean soil layer or equivalent be placed over soils.

- Due to the presence of SVOCs, metals, pesticides, and TPHC DRO at the Site, dust control procedures are recommended during excavation activities to minimize the creation and dispersion of fugitive airborne dust. The Contractor may implement dust control measures to minimize potential airborne contaminants released as a direct result of construction activities. A Community Air Monitoring Plan (CAMP) shall be developed in accordance with NYSDEC DER-10 Regulations. The CAMP requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is intended to provide a measure of protection for the downwind community from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Specific requirements shall be reviewed for each situation in consultation with NYSDOH to ensure proper applicability.
- Dewatering may be necessary during construction activities in the Site. Based on the results of laboratory analyses for NYCDEP sewer discharge criteria, groundwater does not require pre-treatment prior to discharge to sanitary or combined sewers; however, the contractor may be required to obtain a NYCDEP sewer discharge permit if dewatering is necessary.
- If discharge into storm sewers is required during dewatering, it may be done under the appropriate NYSDEC State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis may be required to satisfy NYSDEC requirements prior to discharge into storm sewers.
- Before beginning any excavation activity, the contractor shall submit a Site-specific health and safety plan (HASP) that will meet the requirements set forth by the Occupational, Safety and Health Administration (OSHA), the New York State Department of Health (NYSDOH) and any other applicable regulations. The HASP should identify the possible locations and risks associated with the potential contaminants that may be encountered, and the administrative and engineering controls that will be utilized to mitigate concerns (i.e., dust control procedures for soils containing SVOCs, metals, pesticides, and TPHC DRO).

1.0 INTRODUCTION

On behalf of the New York City Department of Design and Construction (NYCDDC), LiRo Engineers, Inc. (LiRo) conducted a Phase II Environmental Site Investigation (ESI) of the NC-61A Site located at 329 Greenpoint Avenue (the "Site"). The Site is located in the Greenpoint neighborhood of Brooklyn, New York. Excavation for the construction of the Newtown Creek Nature Walk Phase 3, which will consist of a waterfront park including boundary walls and fences with lockable pedestrian and vehicular gateways, parking, a shade structure, fixed seating and tables, planted areas, lighting and signage, is proposed for the Site. Nature Walk Phase 3 design also includes provisions to maintain access to the NYCDEP Floatables Collection Facility that presently exist along the eastern side of Whale Creek Canal. The proposed Nature Walk Site has been subject to City Environmental Quality Review (CEQR) and a CEQR negative declaration was issued on February 17, 2016. The proposed Nature Walk Site has been subject to additional City Environmental Quality Review (CEQR) and a CEQR negative declaration was issued on February 17, 2016. The Phase II ESI was conducted to determine if the Site's environmental condition will impact proposed construction activities.

The Site consists of a vacant lot approximately 430 feet long by 70 feet wide (approximately 0.7-acre area) and is bounded by the intersection of North Henry Street and Kingsland Avenue to the east, Whale Creek to the west, Newtown Creek Wastewater Treatment Plant to the south, and the former Department of Sanitation (DSNY) to the north. The Site is situated in an area characterized by predominantly industrial uses.

The Phase II ESI was completed to assess if potential environmental concerns exist that may impact subsurface conditions at the Site.

A topographic Site Location Map is presented as Figure 1.

1.1 Scope of Work

The Phase II ESI consisted of a field investigation, laboratory analyses, and the preparation of this report, which includes tables summarizing the laboratory analytical results and figures depicting boring locations, significant site features and, if applicable, contamination occurrence and distribution. Drilling activities for the field investigation were performed by Cascade Drilling and Technical Services (Cascade) of Lynbrook, New York. Oversight of drilling activities was performed by LiRo. Laboratory analyses were provided by Chemtech of Mountainside, New Jersey, a NYS Department of Health (NYSDOH) approved laboratory (No. 11376). The field investigation was conducted on October 24 and 25, 2016 and consisted of the following components:

- The soil and groundwater samples collected as part of this Phase II ESI were collected to comply with the NYCDEP CEQR protocols and are as follows.

- The advancement of one (1) boring (SB-01) to a terminal depth of approximately 6 feet below grade (ftbg), a second boring to a terminal depth of approximately 15 ftbg (SB-02), and a third boring to a terminal depth of approximately 5 ftbg (SB-03) due to refusal.
- The borings were cleared to the terminal depths of 5-6 feet using a hand auger. SB-02 was advanced to 15 ftbg using a GeoProbe direct push drill rig. Soil samples within SB-02 were collected using 4-foot long, 2-inch diameter Macro Core stainless steel samplers equipped with polyvinyl chloride (PVC) liners. Soil samples were collected from SB-01 and SB-02 using a post hole digger and/or hand auger. In addition, a Health and Safety Plan was prepared prior to commencing field work.
- Field screening, classification, and identification of soils from the ground surface to the bottom of each boring. Soil samples were visually classified in the field using the Unified Soil Classification System (USCS). Field screening consisted of visual and olfactory indicators of impacts as well as screening with a photoionization detector (PID).
- The collection of three (3) composite and four (4) grab samples from the three (3) soil boring locations (SB-01 through SB-03). The composite samples were comprised of soil from the entire boring column. The grab samples were collected from the 6-inch interval above the water table and/or from the bottom 6-inch interval in each boring.
- Laboratory analysis of the grab samples for: (1) United States Environmental Protection Agency (USEPA) Target Compound List (TCL) volatile organic compounds (VOCs); (2) USEPA TCL semi-volatile organic compounds (SVOCs); (3) TCL polychlorinated biphenyls (PCBs); (4) USEPA pesticides; and, (5) USEPA Target Analyte List (TAL) metals.
- Laboratory analysis of the composite samples for: (1) Total Petroleum Hydrocarbon Diesel Range Organics/Gasoline Range Organics (TPHC DRO/GRO); (2) Resource Conservation and Recovery Act (RCRA) Characteristics; and, (3) Toxicity Characteristic Leaching Procedure (TCLP) RCRA Metals.
- The installation of one (1) temporary well point (TWP) in boring SB-02 and the collection of one (1) groundwater sample from the TWP using direct push technology by installing a slotted PVC screen perpendicular to the groundwater table and riser pipe to grade. Dedicated Teflon tubing was deployed in the TWP and connected to a check valve to extract the groundwater sample.
- Laboratory analysis of the groundwater sample for: (1) USEPA TCL VOCs; (2) USEPA TCL SVOCs; (3) TCL PCBs; (4) USEPA pesticides; (5) USEPA TAL metals (filtered and unfiltered); and, (6) New York City Department of Environmental Protection (NYCDEP) Limitations for Effluent to Sanitary or Combined Sewers (NYCDEP Sewer Discharge Criteria).
- Soil and groundwater Quality Control/Quality Assurance (QA/QC) samples were also collected to comply with the NYCDEP CEQR protocols and submitted for analysis for the following parameters:

  Soil: duplicate soil sample (one [1] in total) from SB-01 – TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals. The duplicate sample was collected from the same soil depth interval as one (1) of the soil samples collected at the Site at the 6-inch interval above the bottom of the boring.

Soil and Groundwater: trip blank (one [1] sample per day) - TCL VOCs. The trip blank includes an unopened water sample prepared by the laboratory which travels with the groundwater sample bottles from the laboratory to the field and from the field to the laboratory. The trip blank sample and the groundwater jars/samples were not separated, and remained in the same coolers.

Groundwater: duplicate groundwater sample (one [1] in total) from the TWP - TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals.

Groundwater: equipment blank (one [1] in total) - TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals. As per CEQR protocol, the groundwater QA/QC sampling did not require the analysis for NYCDEP Sanitary and Combined Sewer discharge parameters.

2.0 SITE DESCRIPTION

2.1 Site Location and Description

The project Site is located in the Greenpoint section of Brooklyn, New York. The Site consists of a vacant lot approximately 430 feet long by 70 feet wide (approximately 0.7 acre area) and is bounded by the intersection of North Henry Street and Kingsland Avenue to the east, Whale Creek to the west, Newtown Creek Wastewater Treatment Plant to the south, and the former DSNY facility to the north.

The Site is developed with a paved lot enclosed by a chain-link fence. Utility inlets and manholes are visible at the Site and indicate the presence of buried utilities including electrical, water, and sewer lines. In addition, existing monitoring wells are present on-site.

Property usage adjoining the Site consists primarily of industrial facilities including Newtown Creek Waste Water Treatment Plant, Allocco Recycling, and Green Chip Electronic Waste Solutions. Whale Creek Canal is west adjacent to the Site.

2.2 Physical Setting

2.2.1 Topography

Based on a review of the United States Geological Survey (USGS.) 7.5-Minute Quadrangle Map, Arthur Kill, NY, dated 2013, the elevation of the Site is approximately 10 to15 feet above mean sea level (msl). The topography of the immediate Site area is gently sloping to the west-northwest. A copy of the topographic map is presented in Figure 1.

2.2.2 Geology

Site and regional geology are based on information provided in the Geologic Map of New York State (Lower Hudson Sheet). In a roughly north-south cross section, the geology can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene age sedimentary deposits, thickening to the south-southeast.

Bedrock in this region is of Precambrian and Paleozoic age. The thickness of the unconsolidated sediment ranges from 0 to approximately 1,300 feet from north to south. Outcrops of metamorphic bedrock can be found along the northwest portions of Queens. The uppermost unconsolidated unit consists of Pleistocene glacial till and moraine deposits in the northern portions of Queens and Kings Counties and glaciofluvial sediments derived from melt-water of the retreating glaciers to the south. These deposits constitute the Upper Glacial Aquifer.

Several episodes of Pleistocene glaciation by a southward advance from New England and the Hudson River valley eroded the Cretaceous deposits. The unconformity that extends across most of Queens and Kings Counties between the Cretaceous deposits and the overlying sediments,

represents glacial scouring and glaciofluvial activity. Evidence of ice contact with the underlying Cretaceous deposits is absent in the southern portion of Queens and Kings Counties, indicating the southernmost limit of the advancing ice sheets.

The oldest Pleistocene deposit, represented only on western Long Island and Queens and Kings Counties is the Jameco Gravel (Jameco Aquifer). It is a channel filling of gravel and coarse sands which may represent a paleo Hudson River.

The terminal moraine of the last glacial advance is represented by the Harbor Hill Moraine. The Moraine trends southwest to northeast through central Kings and Queens Counties. The moraine deposits consist of poorly sorted silts, clays, sands and boulders and form the topographic highs in the area.

The subsurface soils encountered during this Phase II ESI consisted predominantly of dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg. The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13 to 15 ftbg. Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.

2.2.3 Hydrology

Site and regional hydrogeology are based on information provided in the USGS "Hydrogeologic Framework of Long Island, New York." As indicated above, in a roughly north-south cross section, the geology can be characterized as a wedge-shaped layer of Cretaceous and Pleistocene age sedimentary deposits, thickening to the south-southeast. Several impermeable clay layers are located within these sedimentary deposits, generally creating three (3) distinct aquifers. The deep aquifers in southeastern Kings and Queens Counties extend into Nassau and Suffolk Counties and are the sole source of drinking water for Nassau and Suffolk Counties and as such are protected in Kings and Queens Counties. However, the potable water supply for the Site comes from the NYC municipal water system which is primarily withdrawn from the Catskills Reservoir in Upstate New York.

Based on the Phase II ESI, groundwater was encountered within two (2) of the borings at depths ranging from 4 (SB-03) to 9 ftbg (SB-02). The nearest surface water body is Whale Creek which is located west adjacent to the Site and Newtown Creek to the north. Based on elevation and proximity of Whale Creek and Newtown Creek, groundwater flow direction is anticipated to be to the west-northwest. Generally, groundwater flow follows topographic elevation of the area with flow migrating from higher to lower elevations. Groundwater flow direction may also vary due to tidal influence, seasonal fluctuations in precipitation, local usage demands, variation within the local subsurface lithology, underground structures, or local dewatering operations.

According to the United States Fish and Wildlife Service, the west adjacent Whale Creek is identified as a national wetland as E1UBLx. There are no NYSDEC State Wetlands within the area of the Site according to the NYSDEC Wetland Mapper website.

Federal Emergency Management Agency Flood Insurance Rate Maps (FEMA FIRM) were accessed from the FEMA website. Map panel 3604970202F (effective September 5, 2007) shows that the majority of the Site is located in Zone AE with an elevation of 10 ft above msl. A small portion of the Site (westerly portion) is located in Zone X, which is defined as an area with a 0.2 percent annual chance of a flood hazard.

3.0 DESCRIPTION OF FIELD ACTIVITIES

LiRo completed a subsurface investigation on October 24 and 25, 2016 which included the following efforts:

- The advancement of one (1) boring (SB-01) to a terminal depth of approximately 6 feet below grade (ftbg), a second boring to a terminal depth of approximately 15 ftbg (SB-02), and a third boring to a terminal depth of approximately 5 ftbg (SB-03) due to refusal and the field screening of soil samples, including photo-ionization detector (PID) readings and visual and olfactory indicators of contamination (staining, odors);
- The collection of four (4) grab soil samples which were analyzed for the following parameters: (1) United States Environmental Protection Agency (USEPA) Target Compound List (TCL) volatile organic compounds (VOCs); (2) USEPA TCL semi-volatile organic compounds (SVOCs); (3) TCL polychlorinated biphenyls (PCBs); (4) USEPA pesticides; and, (5) USEPA Target Analyte List (TAL) metals;
- The collection of three (3) composite soil samples which were analyzed for the following parameters: (1) Total Petroleum Hydrocarbon Diesel Range Organics/Gasoline Range Organics (TPHC DRO/GRO); (2) Resource Conservation and Recovery Act (RCRA) Characteristics; and, (3) Toxicity Characteristic Leaching Procedure (TCLP) RCRA Metals;
- The installation of one (1) temporary well point (TWP) within soil boring SB-02, the collection of one (1) groundwater sample from the TWP, and the laboratory analyses of this sample for the following parameters: (1) USEPA TCL VOCs; (2) USEPA TCL SVOCs; (3) TCL PCBs; (4) USEPA pesticides; (5) USEPA TAL metals (filtered and unfiltered); and, (6) New York City Department of Environmental Protection (NYCDEP) Limitations for Effluent to Sanitary or Combined Sewers (NYCDEP Sewer Discharge Criteria);
- The soil and groundwater samples collected as part of this Phase II ESI were collected to comply with the NYCDEP CEQR protocols and are as follows;
- Soil and groundwater Quality Control/Quality Assurance (QA/QC) samples were also collected to comply with the NYCDEP CEQR protocols and submitted for analysis for the following parameters:
    - **Soil**: duplicate soil sample (one [1] in total) from SB-01 – TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals. The duplicate sample was collected from the same soil depth interval as one (1) of the soil samples collected at the Site at the 6-inch interval above the bottom of the boring.
    - **Soil and Groundwater**: trip blank (one [1] sample per day) - TCL VOCs. The trip blank includes an unopened water sample prepared by the laboratory which travels with the groundwater sample bottles from the laboratory to the field and from the field to the laboratory. The trip blank sample and the groundwater jars/samples were not separated, and were remained in the same coolers.
    - **Groundwater**: duplicate groundwater sample (one [1] in total) from the TWP installed at SB-02- TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals.

- **Groundwater**: equipment blank (one [1] in total) - TCL VOCs, SVOCs, PCBs, Pesticides, and TAL metals. As per CEQR protocol, the groundwater QA/QC sampling did not require the analysis for NYCDEP Sanitary and Combined Sewer discharge parameters; and,

- The preparation of this report, which includes tables summarizing the laboratory analytical results and figures depicting boring locations, significant site features and, if applicable, contamination occurrence and distribution.

The scope and methods used for the various field activities are documented below.

3.1 Subsurface Soils Investigation

A soil sampling program was conducted as part of this Phase II ESI. Soil samples were collected to assess the Site subsurface conditions. Figures 2 and 3 present the soil sample locations.

As part of this Phase II ESI, subsurface soil sampling was performed on October 24 and 25, 2016. Cascade was the drilling contractor. One (1) boring (SB-01) was advanced to a terminal depth of approximately 6 ftbg, a second boring (SB-02) was advanced to a terminal depth of approximately 15 ftbg, while a third boring (SB-03) was advanced to a terminal depth of approximately 5 ftbg due to refusal. The borings were cleared to 5-6 feet using a hand auger. SB-02 was advanced to 15 ftbg using a GeoProbe direct push drill rig. Soil samples within SB-02 were collected using 4-foot long, 2-inch diameter Macro Core stainless steel samplers equipped with polyvinyl chloride (PVC) liners. Soil samples were collected from SB-01 and SB-03 using a post hole digger and/or hand auger. Soil samples were collected from SB-02 using a disposable spoon. All re-useable sampling equipment was decontaminated using a deionized water and Alconox soap wash and then rinsed with deionized water. The designations and sampling intervals for the samples that were submitted to the laboratory are included in Table 1. Maps depicting each boring location are included as Figures 2 and 3. Boring logs are provided in Appendix B. The locations of each boring are described below:

- SB-01 – Advanced on the northeast portion of the Site 6 feet south of the northerly property line and 12 feet west of the easterly property line near North Henry Street.

- SB-02 – Advanced on the southerly and middle portion of the Site 18 feet north of the southerly property line and 197 feet west of the easterly property line.

- SB-03 – Advanced on the northwest portion of the Site 6 feet south of the northerly property line and 16 feet east of the westerly property line near Whale Creek Canal.

Soil from each boring was classified and examined for visual evidence (i.e., staining, discoloration) and any olfactory indications (i.e., odors) of contamination. In addition, a PID was used to screen the soil for VOC vapors. The maximum PID responses for the corresponding boring are shown on Table 1.

In order to identify representative conditions relative to the presence of TPHC DRO/GRO, RCRA Characteristics, and TCLP RCRA metals over the entire soil column in each boring, composite soil samples were collected by mixing the soil from the entire column (above the water table) in a plastic Ziploc bag. Composite samples were collected from all three (3) soil borings.

To identify representative conditions relative to the presence of VOCs, SVOCs, PCBs, pesticides, and metals, grab samples were collected as follows:

a) SB-01: No visual or olfactory evidence of contamination was identified including PID readings and SB-01 was a shallow boring, one (1) grab sample was collected at the bottom 6-inch interval of the boring along with a duplicate grab sample. One (1) composite soil sample was collected from the entire boring length.
b) SB-2: No visual or olfactory contamination was identified in this boring; this boring was a deep boring to 15 ftbg. Therefore, two (2) grab soil samples were collected. One (1) grab sample was collected from the surface soil (i.e., 0-2 ftbg) while the second grab was collected from the 6-inch interval above the groundwater table which was encountered at approximately 9 ftbg. One (1) composite soil sample was collected from the entire boring length (above the water table).
c) SB-03: No contamination was identified; however, groundwater was encountered at approximately 4 ftbg. Therefore, one (1) grab soil sample was collected from the 6-inch interval above the groundwater table. One (1) composite sample was collected of the entire boring length (above the water table).

The boreholes were backfilled and patched to match the surrounding materials. The soil samples were collected, properly cooled with ice packs and packaged to prevent breakage, and forwarded via courier to Chemtech, which is a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory. Standard chain-of-custody procedures were followed.

Table 1. Soil Sample Analytical Results and Field Measurements

Boring No.	Sample ID	PID (ppm)	Sample Interval (ftbg)	Total VOCs (ug/kg)	Total SVOCs (ug/kg)	Metals Exceed (Yes/No)[1]	Total PCBs (ug /kg)	Total Pesticide (ug /kg)	Total Depth (ftbg)
SB-01	SB-01-5.5-6	<1	5.5-6	4	20,980	Yes	88	ND	6
SB-02	SB-02-0-2RE	<1	0-2	18	16,900	Yes	44	ND	15
	SB-02-8.5-9RE		8.5-9	5	18,646	Yes	ND	ND	
SB-03	SB-03-3.5-4	<1	3.5-4	241	3,800	Yes	ND	28	5

Notes:
PID – Photo-ionization Detector
ppm – parts per million
ug/kg – microgram per kilogram
RE = Re-analyzed per lab quality control requirements
1. Metal(s) exceed Part 375 Unrestricted Use SCOs, Restricted Use (Track 2) SCOs, and/or NYSDEC CP-51 SCLs

3.3 Groundwater Investigation

As groundwater may be encountered within the depths associated with the future excavation, one (1) groundwater sample was collected for screening and laboratory analysis during the soil boring activities. The TWP was installed in soil boring SB-02. Groundwater was encountered within two (2) of the borings at depths ranging from 4 to 9 ftbg. For the installation of the TWP, the TWP was installed by hand. Once the borehole was advanced, the driller pushed the 1 inch PVC screen to the appropriate depth to collect a groundwater sample. The TWP consisted of a 15-foot length section of one-inch diameter schedule 40 PVC screen. A groundwater sample was collected from the TWP via Teflon tubing and check valves. All tubing was new and clean, and was properly disposed after use. Therefore, decontamination was not necessary. Upon extraction, the sample was examined for visual evidence (i.e., discoloration, sheen) and any olfactory indications (i.e., odors) of contamination were noted. Field observations indicated that sample turbidity was high, reflecting the entrainment of sediment in the samples.

A summary of the measurements taken from the TWP is provided as Figure 3. The location of the TWP is provided in Figures 2 and 3.

The groundwater sample was analysed for: (1) TCL VOCs via USEPA Method 8260B; (2) SVOCs via USEPA Method 8270C; (3) PCBs via USEPA Method 3550B/8082; (4) Pesticides via USEPA Method 8081; (4) TAL metals via USEPA 6010/7000 series Methods; and, (5) the NYCDEP as Limitations for Effluent to Sanitary or Combined Sewers (NYCDEP Sewer Discharge Criteria).

Table 2 presents the analyses completed for each groundwater sample.

Table 2. Groundwater Sampling Summary

Sample ID	Depth to Groundwater (ftbg)	TCL VOCs (ug/L)	Total SVOCs (ug/L)	Metals (Unfiltered) Exceed (Yes/No)[1]	Metals (Filtered/ Dissolved) Exceed (Yes/No)[1]	PCBs (ug/L)	Pesticide (ug/L)	NYCDEP Sewer Discharge Criteria Exceed
TWP-02	9	2	7	Yes	Yes	ND	ND	No

Notes:
Ug/L – microgram per liter
1. Metal(s) exceed Part 375 Unrestricted Use SCOs, Restricted Use (Track 2) SCOs, and/or NYSDEC CP-51 SCLs
ND = Non detect

The samples were collected, preserved as necessary, properly cooled with ice packs and packaged to prevent breakage, and forwarded via courier to Chemtech, which is a NYSDOH ELAP-certified analytical laboratory. Standard chain-of-custody procedures were followed.

4.0 FINDINGS

This section discusses the analytical data and findings for the activities discussed in Section 3.0. Tabulated laboratory results are presented in Appendix A. Boring logs and well installation records can be found in Appendix B. Complete analytical data reports are included in Appendix C.

4.1 Subsurface Soil

In order to evaluate the subsurface soil quality, the laboratory analytical results of the grab and composite soil samples were compared with the regulatory standards identified in: (1) NYSDEC Subpart 375-6: Remedial Program Unrestricted and Restricted Use (Track 1 and Track 2) Soil Cleanup Objectives (SCOs); (2) NYSDEC CP-51 Soil Cleanup Levels (SCLs) which include Supplemental Soil Cleanup Objectives (SSCOs) to NYSDEC Subpart 375-6 and SCLs for gasoline/fuel oil contaminated soil; and/or, (3) Toxicity Characteristic Regulatory Levels for Hazardous Waste published in RCRA and 6 NYCRR Part 371.

4.2.1 Field Screening

Field screening (i.e., PID readings and visual and olfactory observations) did not identify impacted soils at the Site. Soil boring logs are presented in Appendix B. Table 3 presents a summary of the visual observations noted.

Table 3. Summary of Field Observations

SOIL BORING	PID LEVELS (PPM)	IMPACTED DEPTH INTERVAL	OBSERVATIONS
SB-01	<1	NA	No PID readings or visual or olfactory evidence of impacts were detected.
SB-02	<1	NA	No PID readings or visual or olfactory evidence of impacts were detected.
SB-03	<1	NA	No PID readings or visual or olfactory evidence of impacts were detected.

Notes:
PID – Photo-ionization Detector
PPM – parts per million
NA – Not Applicable
"Impacted Depth Interval" means either elevated PID readings and/or visual or olfactory evidence of impact.

4.2.2 Volatile Organic Compounds (VOCs)

VOCs were detected in all four (4) grab samples collected but at concentrations below applicable standards. Acetone, bromochloromethane, carbon disulfide, chloroform, ethylbenzene, isopropyl benzene, methylene chloride, o-xylene, tetrachloroethene, trichloroethene, and/or xylene (mixed)

were identified within SB-01-5.5-6, SB-02-0-2, SB-02-8.5-9, and SB-03-3.5-4 at concentrations below the Unrestricted Use (Track 1) SCO, Restricted Use (Track 2) SCOs, and CP-51 SCLs. Acetone and methylene chloride are common laboratory cross contaminants and are most likely not representative of subsurface conditions. A summary of the analytical results for TCL VOC analysis is presented in Table A-1 in Appendix A.

4.2.3 Semi-Volatile Organic Compounds (SVOCs)

SVOCs were detected in all four (4) grab samples collected. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and/or indeno(1,2,3-cd)pyrene were detected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs within SB-01-5.5-6, SB-02-0-2, SB-02-8.5-9, and SB-03-3.5-4. The detected SVOCs may be attributed to: (a) residuals from isolated releases in the area of the Site; and/or, (b) the presence of historic fill material placed at the Site. A summary of the analytical results for TCL SVOC analysis is presented in Table A-2 in Appendix A. Table 4, below, summarizes the detected SVOC concentrations in soil exceeding applicable criteria.

Table 4. Detected SVOC Concentrations in Soil Exceeding Applicable Criteria

Sample Identification	Compound	Concentration (ug/kg)	Part 375 Unrestricted Use (Track 1) SCO	Part 375 Restricted Residential Use (Track 2) SCO	CP-51 Soil SCLs
SB-01-5.5-6	Benzo(a)anthracene	***2,000***	1,000	1,000	1,000
	Benzo(a)pyrene	***1,600***	1,000	1,000	1,000
	Benzo(b)fluoranthene	***1,700***	1,000	1,000	1,000
	Benzo(k)fluoranthene	**890**	800	1,000	800
	Chrysene	***1,800***	1,000	1,000	1,000
	Indeno(1,2,3-cd) pyrene	***900***	500	500	500
SB-02-0-2	Benzo(a)anthracene	***1,800***	1,000	1,000	1,000
	Benzo(a)pyrene	***1,400***	1,000	1,000	1,000
	Benzo(b)fluoranthene	***1,300***	1,000	1,000	1,000
	Chrysene	***1,500***	1,000	1,000	1,000
	Indeno(1,2,3-cd) pyrene	***1,200***	500	500	500
SB-02-8.5-9RE	Benzo(a)anthracene	***1,700***	1,000	1,000	1,000
	Benzo(a)pyrene	***1,200***	1,000	1,000	1,000
	Benzo(b)fluoranthene	***1,600***	1,000	1,000	1,000
	Chrysene	***1,300***	1,000	1,000	1,000
	Indeno(1,2,3-cd) pyrene	***620***	500	500	500

Notes:
ug/kg – microgram per kilogram
RE = Re-analyzed per lab quality control requirements
Shading – Concentration Exceeds Unrestricted Use (Track 1) SCOs
Italicized – Concentration exceeds Restricted Use (Track 2) SCOs
Bold – Concentration exceeds NYSDEC CP-51 SCLs

4.2.4 Target Analyte List (TAL) Metals

TAL metals were detected in all four (4) grab samples collected. Arsenic, chromium (total), copper, iron, lead, mercury, nickel, selenium, and/or zinc were detected at concentrations exceeding either the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs within SB-01-5.5-6, SB-02-0-2, SB-02-8.5-9, and SB-03-3.5-4. The reported concentrations are likely attributed to background levels and/or historic fill material placed at the Site. A summary of the analytical results for metals analysis is presented in Table A-3 in Appendix A. Table 5, below, summarizes the detected metals concentrations in soil exceeding applicable criteria.

Table 5. Detected Metals Concentrations in Soil Exceeding Applicable Criteria

Sample Identification	Compound	Concentration (mg/kg)	Part 375 Unrestricted Use (Track 1) SCO	Part 375 Restricted Residential Use (Track 2) SCO	CP-51 Soil SCLs
SB-01-5.5-6	Arsenic	*16.6*	13	16	NS
	Copper	247	50	270	NS
	Iron	**27,300**	NS	NS	2,000
	Lead	*572*	63	400	NS
	Mercury	0.733	0.18	0.81	NS
	Selenium	7.43	3.9	36	NS
	Zinc	322	109	2,200	NS
SB-02-0-2	Arsenic	14.7	13	16	NS
	Copper	*386*	50	270	NS
	Iron	**16,100**	NS	NS	2,000
	Lead	224	63	400	NS
	Mercury	0.288	0.18	0.81	NS
	Zinc	273	109	2,200	NS
SB-02-8.5-9	Arsenic	13.3	13	16	NS
	Chromium	*182*	30	36	NS
	Copper	129	50	270	NS
	Iron	**25,900**	NS	NS	2,000
	Lead	388	63	400	NS
	Mercury	0.567	0.18	0.81	NS
	Nickel	64.8	30	140	NS
	Selenium	6.62	3.9	36	NS
	Zinc	472	109	2,200	NS
SB-03-3.5-4	Iron	**15,900**	NS	NS	2,000
	Lead	83.1	63	400	NS
	Mercury	0.237	0.18	0.81	NS

Notes:
mg/kg – milligrams per kilogram
NS – No Standard
Shading – Concentration Exceeds Unrestricted Use (Track 1) SCOs
Italicized – Concentration exceeds Restricted Use (Track 2) SCOs
Bold – Concentration exceeds NYSDEC CP-51 SCLs

4.2.5 Pesticides

Pesticides were detected in one (1) of the four (4) grab samples collected. 4,4'-DDE was detected at a concentration above the corresponding Unrestricted Use (Track 1) SCO in SB-03-3.5-4. A summary of the analytical results for the pesticides analysis is presented in Table A-4 of Appendix A. Table 6 summarizes the detected pesticides concentrations in soil exceeding applicable criteria.

Table 6. Detected Pesticides Concentrations in Soil Exceeding Applicable Criteria

Sample Identification	Compound	Concentration (ug/kg)	Part 375 Unrestricted Use (Track 1) SCO	Part 375 Restricted Residential Use (Track 2) SCO	CP-51 Soil SCLs
SB-03-3.5-4	4,4'-DDE	21.4	3.3	1,800	NS

Notes:
ug/kg – micrograms per kilogram
NS – No Standard
Shading – Concentration Exceeds Unrestricted Use (Track 1) SCOs
Italicized – Concentration exceeds Restricted Use (Track 2) SCOs
Bold – Concentration exceeds NYSDEC CP-51 SCLs

4.2.6 Polychlorinated Biphenyls (PCBs)

One (1) PCB was detected in two (2) of the four (4) grab samples collected but at a concentration below the applicable standard. Aroclor 1260 was detected at concentrations below the corresponding Unrestricted Use (Track 1) SCO and Restricted Use (Track 2) SCO within SB-01-5.5-6 and SB-02-0-2. A summary of the analytical results for PCB analysis is presented in Table A-5 of Appendix A.

4.2.7 Waste Characteristics

Ignitability (flash point), reactivity (cyanide and sulfide), and corrosivity (pH) were within the acceptable RCRA ranges in all three (3) composite samples collected. TCLP RCRA metals were not detected at concentrations exceeding RCRA limits in the three (3) waste characterization soil samples collected. TPHC-DRO were detected at concentrations ranging from 35 to 81 milligrams per kilograms (mg/kg) in all three (3) samples (SB-01-COMP, SB-02-COMP, and SB-03-COMP). TPHC-GRO were not detected in any of the three (3) composite samples collected. There are no regulatory standards for TPHC-DRO and TPHC-GRO. Analytical results will need to be compared to levels acceptable by the chosen receiving facility to determine appropriate waste characterization prior to off-site disposal. A summary of the waste characteristics analyses is presented in Table A-6 of Appendix A.

4.3 Groundwater

The analytical results of the groundwater sample were compared to the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards and Guidance Values (AWQSGVs) (Class GA groundwater) and Groundwater Effluent Limitations and the NYCDEP Sewer Discharge Criteria.

4.3.1 Volatile Organic Compounds (VOCs)

One (1) VOC (carbon disulfide) was detected at traceable amount in the groundwater sample collected, but there are no regulatory standards for carbon disulfide. A summary of the TCL VOC results is presented in Table A-7 of Appendix A.

4.3.2 Semi-Volatile Organic Compounds (SVOCs)

One (1) SVOC was detected in the groundwater sample collected but at a concentration below the applicable standards. Dimethyl phthalate was detected within TWP-02 at a concentration below the NYCDEP Sewer Discharge Criteria and TOGS 1.1.1 AWQSGV. A summary of the analytical results for TCL SVOC analysis is presented in Table A-8 of Appendix A.

4.3.3 Target Analyte List (TAL) Metals – Unfiltered and Filtered/Dissolved

TAL metals (unfiltered) were detected in the groundwater sample collected. Arsenic, iron, lead, magnesium, manganese, and sodium were detected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. TAL metals (filtered/dissolved) were detected in the groundwater sample collected. Arsenic, iron, magnesium, manganese, and sodium were detected at concentrations exceeding the TOGS 1.1.1 AWQSGVs. A summary of the TAL Metals results is presented in Table A-9 of Appendix A. A summary of the TAL Metals (dissolved) results is presented in Table A-10 of Appendix A. The full suite of metals analysis can be reviewed in Appendix D. Table 7 summarizes detected TAL unfiltered metals and Table 8, TAL metals filtered/dissolved metals in the groundwater sample.

Table 7. Detected TAL Metals (Unfiltered) Concentrations in Groundwater Exceeding Applicable Criteria

Sample Identification	Compound	Concentration (ug/L)	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values
TWP-02	Arsenic	**67**	NS	25
	Iron	**2,780**	NS	300
	Lead	**33.6**	NS	25
	Magnesium	**183,000**	NS	35,000
	Manganese	**354**	NS	300
	Sodium	**1,070,000**	NS	20,000

Notes:
Ug/L – microgram per liter
NS – No Standard
Shading – Concentration Exceeds NYCDEP Limitations to Sanitary or Combined Sewers
Bold – Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values

Table 8. Detected TAL Metals (Filtered/Dissolved) Concentrations in Groundwater Exceeding Applicable Criteria

Sample Identification	Compound	Concentration (ug/L)	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values
TWP-02	Arsenic	**87.2**	NS	25
	Iron	**1,740**	NS	300
	Magnesium	**205,000**	NS	35,000
	Manganese	**374**	NS	300
	Sodium	**961,000**	NS	20,000

Notes:
Ug/L – microgram per liter
NS – No Standard
Shading – Concentration Exceeds NYCDEP Limitations to Sanitary or Combined Sewers
Bold – Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values

4.3.4 Pesticides

Pesticides were not detected in the groundwater sample collected. A summary of the analytical results for the pesticides analysis is presented in Table A-11 of Appendix A.

4.3.5 Polychlorinated Biphenyls (PCBs)

The laboratory results indicate that no detectable concentrations of PCBs were present in the groundwater samples. A summary of the analytical results for PCBs analysis is present in Table A-12 of Appendix A.

4.3.6 New York City Department of Environmental Protection (NYCDEP) Sewer Discharge Criteria

The groundwater sample (TW-02) was analyzed for the parameters required by the NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (Daily Limit). All parameters were within NYCDEP Sewer Discharge Criteria. A summary of the results for NYCDEP Sewer Discharge Criteria is present in Table A-13 of Appendix A.

4.3.7 Quality Assurance/Quality Control Data

One (1) duplicate soil sample was collected from SB-01 and analyzed for VOCs, SVOCs, metals, pesticides, and PCBs. The results for the duplicate sample were generally consistent with the primary soil sample. Soil duplicate results are provided in Tables A-1 through A-5.

One (1) duplicate groundwater sample was collected from TWP-02 (SB-02) and analyzed for VOCs, SVOCs, metals, pesticides, and PCBs. The results for this duplicate sample were generally consistent with those detected within the primary TWP-02 (SB-02) groundwater sample. Groundwater duplicate results are provided in Tables A-7 through A-12.

One (1) equipment blank sample was collected during the subsurface investigation. Based on the analytical results of this sample, no VOCs, SVOCs, metals, pesticides, or PCBs exceedances were detected.

No VOCs were reported within the one (1) trip blank sample submitted for analysis.

5.0 CONCLUSIONS AND RECOMMENDATIONS

LiRo performed a subsurface investigation on October 24 and 25, 2016 that consisted of three (3) soil borings and one (1) TWP to assess Site conditions.

5.1 Conclusions

Based on the results of the Phase II ESI, the following conclusions are made:

- Field screening (i.e., PID readings and visual and olfactory observations) did not identify impacted soils within the Site.
- The Site is underlain by dark brown to black fine to medium sand with gravel and fill material from grade to 13 ftbg in at least SB-02. The fill material consisted predominantly of brick, ceramic, and timber wood. Layers of concrete were also noted at SB-02 from grade to 3.5 ftbg. Peat was noted within SB-02 from 13-15 ftbg. Groundwater was encountered within two (2) of the borings at depths ranging from 4 (SB-03) to 9 ftbg (SB-02). Bedrock was not encountered during the Phase II ESI; however, refusal was encountered within SB-03 at 5 ftbg.
- Subsurface soils contain elevated concentrations of SVOCs, metals, pesticides, and TPHC DRO that exceed the Unrestricted Use (Track 1) SCOs, Restricted Use (Track 2) SCOs, and/or CP-51 SCLs and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).
- Concentrations of metals (unfiltered and filtered/dissolved) were detected at concentrations above the State Groundwater quality standards and are attributed to residuals from releases in the vicinity of the Site, contaminants in historic fill material placed on the Site, and/or natural background levels (metals).
- The groundwater at the Site meets the NYCDEP Sewer Discharge Criteria for sanitary, storm or combined sewers.
- The subsurface soil samples and groundwater collected from the Site are non-hazardous based on waste characterization testing.

5.2 Recommendations

For the Site to be suitable for proposed development, the following measures are recommended:

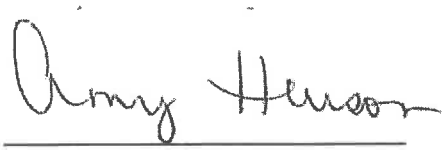
- Based on the SVOCs, metals, pesticides, and TPHC DRO contamination identified during the investigation, the Contract documents should identify provisions and a contingency for managing, handling, transporting and disposing of such soils. The Contractor should be required to submit a Material Handling Plan to identify the specific protocol and procedures that will be employed to manage the waste in accordance with applicable regulations.

- It is expected that after the proposed Nature Walk water front park is constructed, there will be no exposed soil left at the Site. The landscaped areas incorporated into the development of the Site should include a 24 inch certified-clean soil layer or equivalent be placed over soils.
- Due to the presence of SVOCs, metals, pesticides, and TPHC DRO at the site, dust control procedures are recommended during excavation activities to minimize the creation and dispersion of fugitive airborne dust. The Contractor may implement dust control measures to minimize potential airborne contaminants released as a direct result of construction activities. A Community Air Monitoring Plan (CAMP) shall be developed in accordance with NYSDEC DER-10 Regulations. The CAMP requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is intended to provide a measure of protection for the downwind community from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Specific requirements shall be reviewed for each situation in consultation with NYSDOH to ensure proper applicability.
- Dewatering may be necessary during construction activities in the Site. Based on the results of laboratory analyses for NYCDEP sewer discharge criteria, groundwater does not require pre-treatment prior to discharge to sanitary or combined sewers; however, the contractor may be required to obtain a NYCDEP sewer discharge permit if dewatering is necessary.
- If discharge into storm sewers is required during dewatering, it may be done under the appropriate NYSDEC State Pollutant Discharge Elimination System (SPDES) permit. Additional sampling and laboratory analysis may be required to satisfy NYSDEC requirements prior to discharge into storm sewers.
- Before beginning any excavation activity, the contractor shall submit a Site-specific health and safety plan (HASP) that will meet the requirements set forth by the Occupational, Safety and Health Administration (OSHA), the New York State Department of Health (NYSDOH) and any other applicable regulations. The HASP should identify the possible locations and risks associated with the potential contaminants that may be encountered, and the administrative and engineering controls that will be utilized to mitigate concerns (i.e., dust control procedures for soils containing SVOCs, metals, pesticides, and TPHC DRO).

6.0 STATEMENT OF LIMITATIONS AND SIGNATURES OF PROFESSIONALS

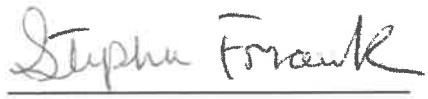
LiRo has performed a Phase II ESI of the Newtown Creek Nature Walk Phase 3 Site located at 329 Greenpoint Avenue, Brooklyn, New York. The data presented and the opinions expressed in this report are qualified as stated in the attachment to this section of the report. Signature of the professionals that prepared the Phase II ESI can be found below. Qualifications for these individuals are provided in Appendix D.

Report Prepared By:



Amy Hewson
Senior Environmental Analyst

Report Reviewed By:



Stephen Frank
Senior Geologist

Report Reviewed By:



Robert Kreuzer
Project Manager

STATEMENT OF LIMITATIONS

The data presented and the opinions expressed in this report are qualified as follows:

The sole purpose of the investigation and of this report is to assess the physical characteristics of the Site with respect to the presence or absence in the environment of oil or hazardous materials and substances as defined in the applicable State and Federal environmental laws and regulations and to gather information regarding current and past environmental conditions at the Site.

LiRo derived the data in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals with information about the Site, and a limited number of subsurface explorations made on the dates indicated. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the Site, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in the report.

In preparing this report, LiRo has relied upon and presumed accurate certain information (or the absence thereof) about the Site and adjacent properties provided by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, LiRo has not attempted to verify the accuracy or completeness of any such information.

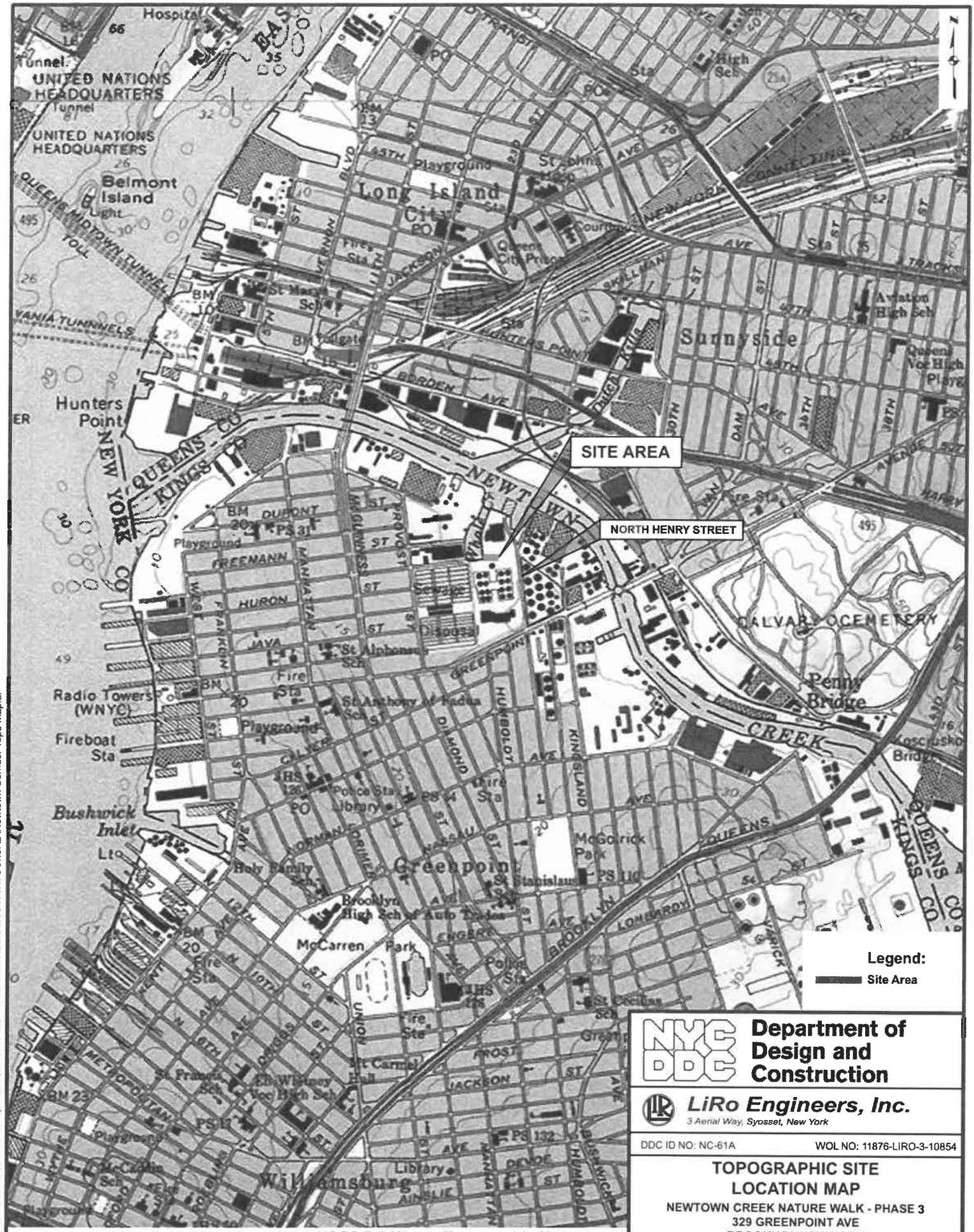
The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Services, including the extent of subsurface exploration and other tests. The Scope of Services was defined by the requests of the Client, the time and budgetary constraints imposed by the Client, and the availability of access to the Site.

Because of the limitations stated above, the findings, observations, and conclusions expressed by LiRo in this report are not, and should not be considered, an opinion concerning the compliance of any past or present owner or operator of the Site with any Federal, State or local law or regulation. No warranty or guarantee, whether expressed or implied, is made with respect to the data reported or findings, observations, and conclusions expressed in this report. Further, such data, findings, observations, and conclusions are based solely upon Site conditions in existence at the time of investigation.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the Agreement and the provisions thereof.

FIGURES

FIGURE 1 – TOPOGRAPHIC SITE LOCATION MAP
FIGURE 2 – SAMPLE LOCATION PLAN
FIGURE 3 – BORING LOCATION SKETCH



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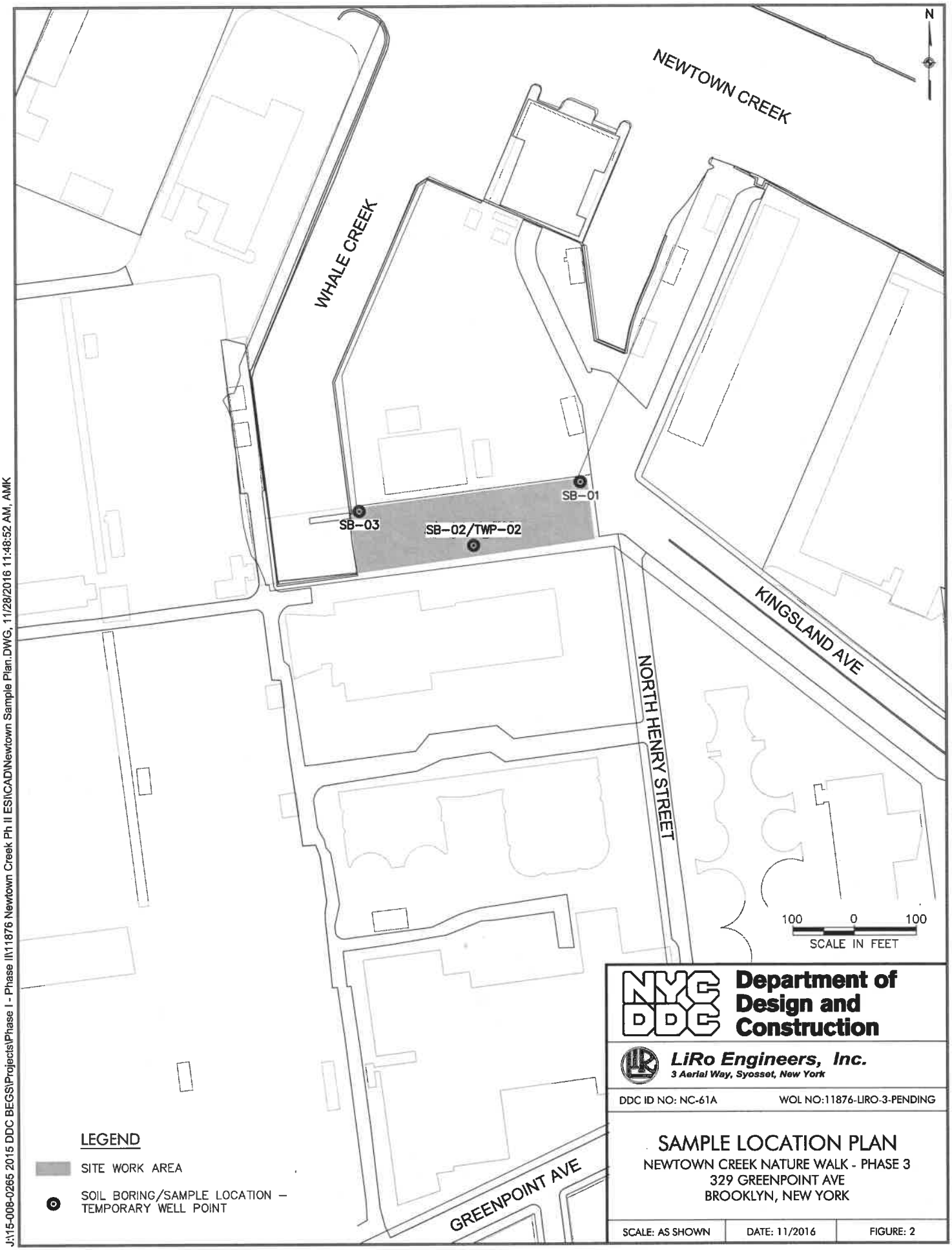
DDC ID NO: NC-61A | WOL NO: 11876-LIRO-3-10854

TOPOGRAPHIC SITE LOCATION MAP

NEWTOWN CREEK NATURE WALK - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 11/2016	FIGURE: 1

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Department of Design and Construction

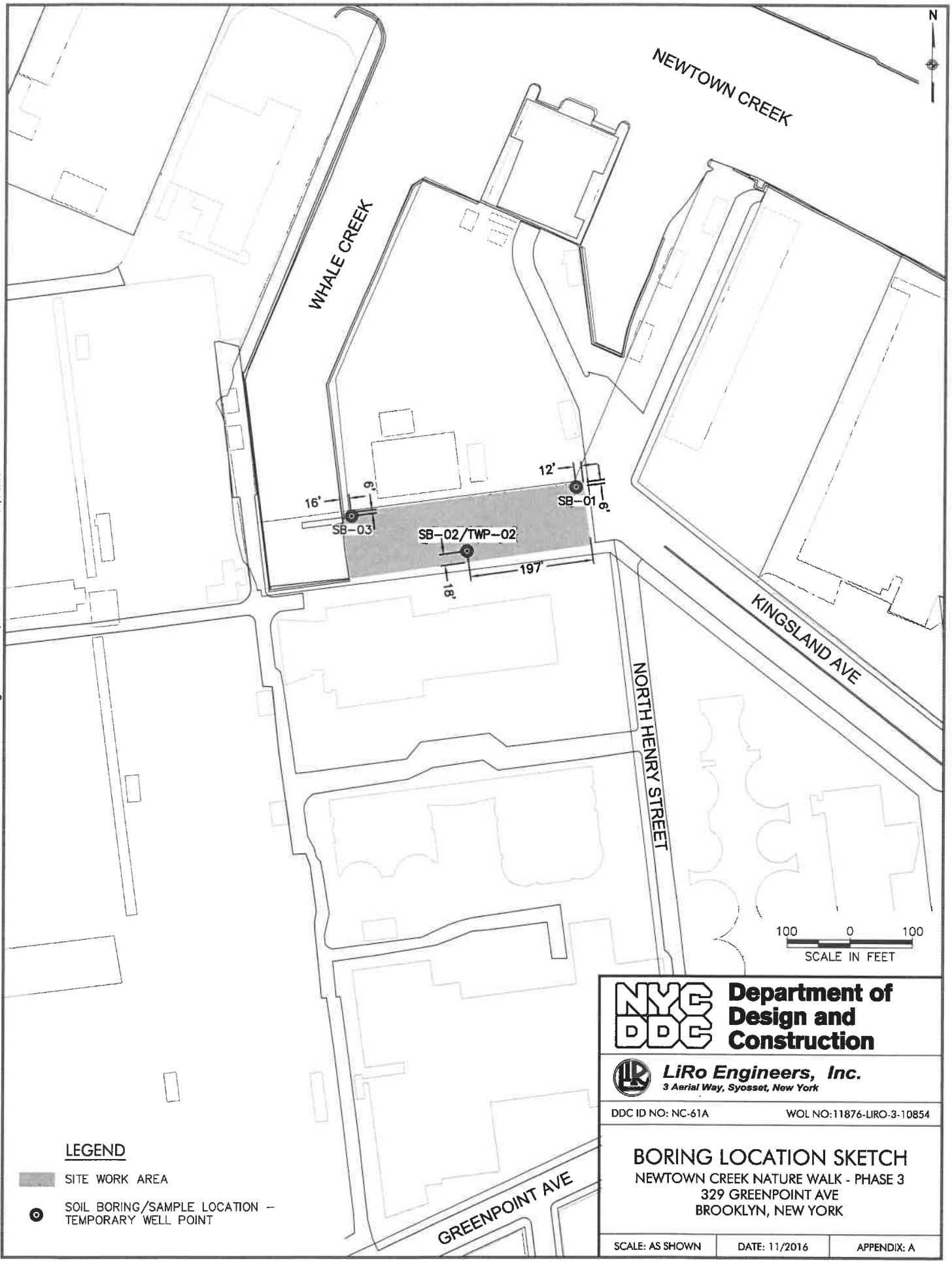
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DDC ID NO: NC-61A | WOL NO:11876-LIRO-3-PENDING

SAMPLE LOCATION PLAN

NEWTOWN CREEK NATURE WALK - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 11/2016	FIGURE: 2



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DDC ID NO: NC-61A | WOL NO:11876-LIRO-3-10854

BORING LOCATION SKETCH

NEWTOWN CREEK NATURE WALK - PHASE 3
329 GREENPOINT AVE
BROOKLYN, NEW YORK

SCALE: AS SHOWN	DATE: 11/2016	APPENDIX: A

APPENDICES

APPENDIX A
SUMMARY TABLES OF SOIL AND GROUNDWATER ANALYTICAL RESULTS

Table A-1. Summary of Target Compound List (TCL)
Volatile Organic Compounds (VOCs) Detected in Soil

TCL VOC	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs) / Supplemental Soil Cleanup Objectives (SSCOs) - Residential	Sample ID, Date Collect, and Depth (ft bgs)					
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2RE	SB-02-8.5-9RE	SB-03-3.5-4	Trip Blank
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016	NA
				5.5-6	5.5-6	0-2	8.5-9	3.5-4	NA
Acetone	50	100,000	NS	ND	ND	12.3 J	ND	ND	ND
Bromochloromethane	NS	NS	NS	1.3 J	ND	ND	ND	ND	ND
Carbon Disulfide	NS	NS	100,000	ND	ND	1.1 J	ND	ND	ND
Chloroform	370	10,000	NS	ND	1.7 J	ND	ND	ND	ND
Ethylbenzene	1,000	30,000	NS	ND	ND	ND	ND	2.5 J	ND
Isopropylbenzene	NS	NS	100,000	ND	ND	ND	ND	1.6 J	ND
Methylene chloride	50	51,000	NS	3.1 J	6.9	4.7 J	4.9 J	7.2	ND
o-Xylene	NS	NS	NS	ND	ND	ND	ND	7.1	ND
Tetrachloroethene	1,300	5,500	NS	ND	ND	ND	ND	210 JD	ND
Trichloroethene	470	10,000	NS	ND	ND	ND	ND	2.9 J	ND
Xylene (Mixed)	260	100,000	260	ND	ND	ND	ND	9.9 J	ND
Total VOCs	NS	NS	NS	4	9	18	5	241	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
NS = No Standard
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
J = Compound detected below the quantitation limit
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 SCLs = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - Soil Cleanup Levels for Gasoline Contaminated Soils, Table 3 - Soil Cleanup Levels for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table A-2. Summary of Target Compound List (TCL)
Semi-Volatile Organic Compounds (SVOCs) Detected in Soil

TCL SVOC	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collect, and Depth (ft bgs)				
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9RE	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
2-Methylnaphthalene	NS	NS	410	ND	ND	ND	140 J	ND
Acenaphthene	20,000	100,000	20,000	ND	960 J	ND	340 J	ND
Acenaphthylene	100,000	100,000	100,000	ND	ND	ND	95.5 J	ND
Anthracene	100,000	100,000	100,000	820 J	2,100 J	ND	540	ND
Benzo(a)anthracene	1,000	1,000	1,000	***2,000***	***3,800 J***	***1,800 J***	***1,700***	ND
Benzo(a)pyrene	1,000	1,000	1,000	***1,600 J***	***2,800 J***	***1,400 J***	***1,200***	ND
Benzo(b)fluoranthene	1,000	1,000	1,000	***1,700 J***	***2,900 J***	***1,300 J***	***1,600***	ND
Benzo(g,h,i)perylene	100,000	100,000	100,000	850 J	1,700 J	1,100 J	770	ND
Benzo(k)fluoranthene	800	1,000	800	**890 J**	***1,500 J***	ND	410	ND
Carbazole	NS	NS	NS	ND	ND	ND	170 J	ND
Chrysene	1,000	1,000	1,000	***1,800 J***	***3,200 J***	***1,500 J***	***1,300***	ND
Dibenz[a,h]anthracene	330	330	330	ND	ND	ND	230 J	ND
Dibenzofuran	NS	NS	NS	ND	870 J	ND	210 J	ND
Dimethylphthalate	NS	NS	100,000	520 J	ND	ND	830	ND
Flouranthene	100,000	100,000	100,000	3,400	7,300	2,700 J	2,800	1,200 J
Fluorene	30,000	100,000	30,000	ND	1,300 J	ND	290 J	ND
Indeno(1,2,3-cd)pyrene	500	500	500	***900 J***	***1,800 J***	***1,200 J***	***620***	ND
Napthalene	12,000	100,000	12,000	ND	ND	ND	300 J	ND
Phenanthrene	100,000	100,000	100,000	3,400	9,200	2,800 J	2,800	1,400 J
Pyrene	100,000	100,000	100,000	3,100	8,300	3,100 J	2,300	1,200 J
Total SVOCs	NS	NS	NS	20,980	47,730	16,900	18,646	3,800

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
J = Compound detected below the quantitation limit
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table A-3. Summary of Target Analyte List (TAL) Metals Detected in Soil

Target Analyte List Metal	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collected, and Depth (ft bgs)				
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
Aluminum	NS	NS	NS	5,310	5,060	5,660	7,140	8,300
Antimony	NS	NS	NS	7.74	30.4	1.45 J	1.02 J	ND
Arsenic	13	16	NS	*16.6*	*18.2*	14.7	13.3	4.53
Barium	350	350	NS	184	202	89.4	181	83.5
Beryllium	7.2	14	NS	0.259 J	0.27 J	0.4	0.33	0.351
Cadmium	2.5	2.5	NS	0.254 J	0.343	0.435	1.67	ND
Calcium	NS	NS	NS	9,100	8,080	26,700	9,900	32,800
Chromium (total)	30	36	NS	21.6	19.2	17.7	*182*	19.7
Cobalt	NS	NS	30	9.04	7.28	5.93	10.2	7.36
Copper	50	270	NS	*247*	*266*	*386*	*129*	35.4
Iron	NS	NS	2,000	**27,300**	**30,900**	**16,100**	**25,900**	**15,900**
Lead	63	400	NS	*572*	*549*	*224*	*388*	*83.1*
Magnesium	NS	NS	NS	1,710	1,340	4,130	2,630	5,840
Manganese	1,600	2,000	NS	307	293	168	215	219
Mercury	0.18	0.81	NS	*0.733*	*0.681*	*0.288*	*0.567*	*0.237*
Nickel	30	140	NS	20.4	20	17.7	*64.8*	22
Potassium	NS	NS	NS	675	611	848	1,140	1,220
Selenium	3.9	36	NS	*7.43*	*8.65*	1.85	*6.62*	0.857 J
Sodium	NS	NS	NS	354	330	196	425	348
Thallium	NS	NS	NS	0.628 J	0.726 J	ND	0.375 J	ND
Vanadium	NS	NS	100	23.1	20.6	22.7	25.1	41.3
Zinc	109	2,200	NS	*322*	*344*	*273*	*472*	107

Notes:
All concentrations are in parts per million (ppm or mg/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
J = Estimated value
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table A-4. Summary of Pesticides Detected in Soil

Pesticides	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs)	Sample ID, Date Collected, and Depth (ft bgs)				
				SB-01-5.5-6RE	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
4,4'-DDE	3.3	1,800	NS	ND	ND	ND	ND	21.4
Chlordane (alpha)	94	910	NS	ND	ND	ND	ND	6.7
Gamma-BHC	NS	NS	NS	ND	3.8	ND	ND	ND
Total Pesticides	NS	NS	NS	ND	4	ND	ND	28

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
RE = Re-analyzed per lab quality control requirements
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 Soil Cleanup Levels (SCLs) = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - SCLs for Gasoline Contaminated Soils, Table 3 - SCLs for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table A-5. Summary of Polychlorinated Biphenyls (PCBs) Detected in Soil

PCBs	Part 375-6.8 (a) Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs)	Part 375-6.8 (b) Restricted Use (Track 2) Residential Soil Cleanup Objectives (SCOs)	CP-51 Soil Cleanup Levels (SCLs) / Supplemental Soil Cleanup Objectives (SSCOs) - Residential	Sample ID, Date Collect, and Depth (ft bgs)				
				SB-01-5.5-6	SB-01-5.5-6-DUP	SB-02-0-2	SB-02-8.5-9	SB-03-3.5-4
				10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016
				5.5-6	5.5-6	0-2	8.5-9	3.5-4
Aroclor 1260	NS	NS	NS	87.9 P	62.9 P	43.5 P	ND	ND
Total PCBs	100	1,000	NS	88	63	44	ND	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/kg)
ft bgs = feet below grade surface
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
NS = No Standard
P = Indicates >25% difference for detected
SCOs = Soil Cleanup Objectives as per the NYSDEC Regulations 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (December 14, 2006).
CP-51 SCLs = New York State Department of Environmental Conservation (NYSDEC) CP-51 – Soil Cleanup Guidance (CP-51) (October 21, 2010).

BOLD = Concentration exceeds NYSDEC CP-51 SCLs Table 1 - Supplemental Soil Cleanup Objectives (Residential), Table 2 - Soil Cleanup Levels for Gasoline Contaminated Soils, Table 3 - Soil Cleanup Levels for Fuel oil Contaminated Soil
Shading = Concentration exceeds Unrestricted Use (Track 1) Soil Cleanup Objectives
Italicized = Concentration exceeds Restricted Use (Track 2) Residential Soil Cleanup Objectives

Table A-6. Summary of Waste Characterization in Soil

Parameter	6 NYCRR Part 371 and RCRA	Sample ID, Date Collected, Sample Type		
		SB-01-COMP	SB-02-COMP	SB-03-COMP
		10/24/2016	10/25/2016	10/25/2016
		Composite	Composite	Composite
METALs[1]	**ug/L**			
Arsenic	5,000	ND	96.5 J	31.2 J
Barium	100,000	1,540	1,140	258 J
Cadmium	1,000	30.9	ND	ND
Chromium	5,000	15.6 J	ND	ND
Lead	5,000	821	86.1	ND
MISC. PARAMETERS (units)				
Reactivity Sulfide (mg/kg)	500	ND	ND	30.2
pH (SU)	2-12.5	8.65	8.7	10.7
Ignitability	>140 °F	No	No	No
TPHC Diesel Range Organics (mg/kg)	NS	81.369	42.997	35.003
TPHC Gasoiline Range Organics (mg/kg)	NS	ND	ND	16 J

Notes:
ft bgs = feet below grade surface
NS = No Standard
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
SU = Standard unit
mg/Kg = milligram per kilogram
ug/L = microgram per liter
[1] = TCLP RCRA Metals

Shading = Concentration exceeds 6 NYCRR Part 371 and RCRA Toxicity Characteristic Regulatory Levels for Hazardous Waste.

Table A-7. Summary of Target Compound List (TCL) Volatile Organic Compounds (VOCs) Detected in Groundwater

TCL VOC[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02	TWP-02-DUP	Equipment Blank
			10/25/2016	10/25/2016	10/25/2016
Carbon Disulfide	NS	NS	2.2 J	1.5 J	ND
Total VOCs	NS	NS	2	2	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
J = Compound detected below the quantitation limit

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table A-8. Summary of Target Compound List (TCL) Semi-Volatile Organic Compounds (SVOCs) Detected in Groundwater

TCL SVOC[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02	TWP-02-DUP	Equipment Blank
			10/25/2016	10/25/2016	10/25/2016
bis(2-Ethylhexyl)phthalate	NS	5	ND	ND	2.2 J
Dimethylphthalate	NS	50	6.9 J	4.1 J	ND
Total SVOCs	NS	NS	7	4	2

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
J = Compound detected below the quantitation limit
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table A-9. Summary of Target Analyte List (TAL) Metals Detected in Groundwater

Target Analyte List Metal[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02 10/25/2016	TWP-02-DUP 10/25/2016	Equipment Blank 10/25/2016
Aluminum	NS	NS	1,770 N	1,770 N	ND
Arsenic	NS	25	**67 N**	**68.6 N**	ND
Barium	NS	1,000	234 N	234 N	ND
Calcium Metal	NS	NS	174,000	178,000	ND
Chromium	NS	50	13	7.87	ND
Copper	NS	200	8.99 J	7.68 J	ND
Iron	NS	300	**2,780 N**	**2,870 N**	ND
Lead	NS	25	**33.6**	**36.4**	ND
Magnesium	NS	35,000	**183,000**	**184,000**	ND
Manganese	NS	300	**354 N**	**376 N**	ND
Mercury	NS	0.7	0.413	0.292	ND
Nickel	NS	100	8.82 J	6.76 J	ND
Potassium	NS	NS	99,700	102,000	39.3 J
Sodium	NS	20,000	**1,070,000**	**932,000**	635 J
Vanadium	NS	NS	5.65 J	5.79 J	ND
Zinc	NS	2,000	21.1	21.3	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
N = Presumative evidence of a compound
J = Compound detected below the quantitation limit
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table A-10. Summary of Target Analyte List (TAL) Metals (Dissolved) Detected in Groundwater

Target Analyte List Metal[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect	
			TWP-02 10/25/2016	TWP-02-DUP 10/25/2016
Aluminum	NS	NS	88 N	90.3 N
Arsenic	NS	25	**87.2 N**	**82.8 N**
Barium	NS	1,000	254 N	246 N
Calcium Metal	NS	NS	194,000	187,000
Chromium	NS	50	2.63 J	7.28
Copper	NS	200	3.75 J	4.02 J
Iron	NS	300	**1,740 N**	**1,710 N**
Lead	NS	25	6.39	6.7
Magnesium	NS	35,000	**205,000**	**198,000**
Manganese	NS	300	**374 N**	**343 N**
Nickel	NS	100	4.41 J	6.5 J
Potassium	NS	NS	115,000	110,000
Sodium	NS	20,000	**961,000**	**929,000**
Vanadium	NS	NS	5.02 J	ND
Zinc	NS	2,000	10.8 J	11.9 J

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
N = Presumative evidence of a compound
J = Compound detected below the quantitation limit
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table A-11. Summary of Pesticides Detected in Groundwater

Pesticdes[1]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02	TWP-02-DUP	Equipment Blank
			10/25/2016	10/25/2016	10/25/2016
Total Pesticides	NS	NS	ND	ND	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for SB Waterbody Classifications
NS = No Standard/Not Sampled
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
ft bgs = feet below grade surface

Bold = Positive detection
BOLD and Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Italicized = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.

Table A-12. Summary of Polychlorinated Biphenyls (PCBs) Detected in Groundwater

PCBs[1, 2]	NYCDEP Limitations to Sanitary or Combined Sewers	NYS Ambient Water Quality Standards/Guidance Values	Sample ID & Date Collect		
			TWP-02	TWP-02-DUP	Equipment Blank
			10/25/2016	10/25/2016	10/25/2016
Total PCBs	1	0.000001	ND	ND	ND

Notes:
All concentrations are reported in parts per billion (ppb or ug/L)
NYS Ambient Water Quality Standards/Guidance Values for Class GA Waterbody
ND = Compound not detected above method detection limit (see attached lab report for mdl's)
ft bgs = feet below grade surface

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit)
Bold = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values - Class GA Waters

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.
[2] Analysis for PCBs was performed according to EPA method 608 with method detection limit =<65 parts per trillion. Analysis for PCBs is required if discharge =>10,000 gallons per day (gpd) and duration of discharge > 10 days.

Table A-13. Summary of Groundwater Quality

Parameter[1]	NYCDEP Limitations to Sanitary or Combined Sewers		Sample ID & Date Collect TWP-02 10/25/2016	
CBOD[4]	NS	mg/L	95.2	
Chloride[4]	NS	mg/L	3,840	
Flash Point - Liquid/Solid	> 140	°F	>212	
Non-Polar Material[2]	50	mg/L	1.4	J
pH	5-12	pH	7.49	H
Phenolics	NS	mg/L	2.1	J
Temperature	150	Fah.	17.8	H
TKN	NS	mg/L	4.07	
Total Nitrogen[4]	NS	mg/L	4.07	
Total Solids[4]	NS	mg/L	7,668	
Total Suspended Solids (TSS)[3]	350	mg/L	199	
Copper	5	mg/L	0.0108	
Lead	2	mg/L	0.0441	
Mercury	0.05	mg/L	0.000345	
Nickel	3	mg/L	0.00558	J
Zinc	5	mg/L	0.015	J

Notes:
NS = No Standard/Not Sampled
mg/L = milligram per liter
H = Sample analysis out of hold time
J = Compound detected below the quantitation limit

Shaded = Concentration exceeds NYCDEP Limitations for Effluent to Sanitary or Combined Sewers (daily limit).
Italicized = Concentration exceeds NYS Ambient Water Quality Standards/Guidance Values

[1] All handling and preservation of collected samples and laboratory analyses of samples was performed in accordance with 40 CFR Part 136.
[2] Analysis for non-polar materials was performed by USEPA method 1664.
[3] For discharge >= 10,000 gallons per day (gpd), the TSS limit is 350 mg/l. For discharge < 10,000 gpd, the limit is determined on a case by case basis.
[4] Analysis for Carbonaceous Biochemical Oxygen Demand (CBOD), Chloride, Total Solids, and Total Nitrogen are required if proposed discharge >= 10,000 gpd.

APPENDIX B
BORING LOGS AND TWP WELL INSTALLATION RECORDS

LiRo Engineers, Inc.

TEST BORING LOG

BORING NO:	**SB-01**
SHEET:	**1 of 3**
JOB NO.:	**15-008-0265**
LOCATION:	**Kingsland Ave.**
GROUND ELEVATION:	**NA**
DATE STARTED:	**October 24, 2016**
DATE FINISHED:	**October 24, 2016**
DRILLER:	**Evan M.**
GEOLOGIST:	**Eva Jakubowska**
REVIEWED BY:	

PROJECT: Newtown Creek Nature Walk-Phase 3, Greenpoint Ave., Brooklyn, NY

CLIENT: Department of Design and Construction - OEGS - NC-61A-11876

BORING CONTRACTOR: Cascade Technical Services, LLC.

GROUNDWATER: NA

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	TUBE
			NA	DIA.		5' Macros	
				WT.			
				FALL			

DEPTH FEET	SAMPLE STRATA	"S" NO.	"N" NO.	BLOWS PER 6"	REC% RQD%	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS
1					NA	Dark brown to dark grey	NA	0-6": Asphalt 6"-6.0': Fine to medium SAND with gravel and fill material (red brick pieces, ceramic, timber wood, etc.)	FILL	Cleared to 6 ftbg 0.0 ppm Moist
6								End of boring at 6 ftbg.		
10										
15										
20										
25										
30										
35										

COMMENTS: Grab sample collected @ 5.5-6.0 ftbg for VOCs, SVOCs, metals, PCBs, and pesticides. A duplicate grab sample was collected at the same depth. Composite sample collected from 0-6.0 ftbg for TPHC DRO/GRO, RCRA Characteristicis, and TCLP RCRA metals. Soil was classified according to the Unified Soil Classification System (USCS).

PROJECT NO.: 15-008-0265

BORING NO.: SB-01

LiRo Engineers, Inc.

TEST BORING LOG

BORING NO:	SB-02
SHEET:	2 of 3
JOB NO.:	15-008-0265
LOCATION:	Kingsland Ave.
GROUND ELEVATION:	NA
DATE STARTED:	October 24, 2016
DATE FINISHED:	October 25, 2016
DRILLER:	Evan M.
GEOLOGIST:	Eva Jakubowska
REVIEWED BY:	

PROJECT: Newtown Creek Nature Walk-Phase 3, Greenpoint Ave., Brooklyn, NY

CLIENT: Department of Design and Construction - OEGS - NC-61A-11876

BORING CONTRACTOR: Cascade Technical Services, LLC.

GROUNDWATER: 9'

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	TUBE
			NA	DIA.		5' Macros	
				WT.			
				FALL			

DEPTH FEET	STRATA	SAMPLE "S" NO.	SAMPLE "N" NO.	BLOWS PER 6"	REC% RQD%	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS
1					NA	Dark brown	NA	0-8": Asphalt 8"-1.5': Medium SAND with fill material. 1.5-1.9': Layer of concrete. 1.9-3.0': Medium SAND and fill material. 3.0-3.5': Layer of concrete. 3.5-6.0': Medium SAND and fill material.	FILL	Cleared to 6 ftbg 0.0 ppm Moist
6										
10					50%	Dark brown to black	Medium dense	6.0-9.0': Medium SAND and fill material. 9.0-10.0 Fine SAND traces of peat (organic) and fill material.		0.0 ppm Moist West at 9 ftbg
15					70%	Vey dark brown to dark grey	Medium dense	10.0-13.0': Fine to medium SAND with rocks and fill material. 13.0-15.0': Peat (organic).	FILL PT	0.0 ppm Saturated; sewage like smell.
20								End of Boring at 15 ftbg		
25										
30										
35										

COMMENTS: Grab sample collected @ 0-2 ftbg and 8.5-9 ftbg for VOCs, SVOCs, metals, PCBs, and pesticides. Composite sample collected from 0-9 ftbg for TPHC DRO/GRO, RCRA Characteristicis, and TCLP RCRA metals. Soil was classified according to the Unified Soil Classification System (USCS).

PROJECT NO.: 15-008-0265

BORING NO.: SB-02

LiRo Engineers, Inc.

TEST BORING LOG

BORING NO:	**SB-03**
SHEET:	**3 of 3**
JOB NO.:	**15-008-0265**
LOCATION:	**Kingsland Ave.**
GROUND ELEVATION:	**NA**
DATE STARTED:	**October 25, 2016**
DATE FINISHED:	**October 25, 2016**
DRILLER:	**Evan M.**
GEOLOGIST:	**Eva Jakubowska**
REVIEWED BY:	

PROJECT: Newtown Creek Nature Walk-Phase 3, Greenpoint Ave., Brooklyn, NY

CLIENT: Department of Design and Construction - OEGS - NC-61A-11876

BORING CONTRACTOR: Cascade Technical Services, LLC.

GROUNDWATER: 4'

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	TUBE
			NA	DIA.		5' Macros	
				WT.			
				FALL			

DEPTH FEET	SAMPLE STRATA	"S" NO.	"N" NO.	BLOWS PER 6"	REC% RQD%	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	USCS	REMARKS
1					NA	Dark brown	NA	0-5.0': Medium SAND with gravel and fill material (red brick pieces, ceramic, timber wood, etc.)	FILL	Cleared to 5 ftbg 0.0 ppm Moist Wet at 4 ftbg
5								End of boring at 5 ftbg. Due to refusal.		
10										
15										
20										
25										
30										
35										

COMMENTS: Grab sample collected @ 3.5-4 ftbg for VOCs, SVOCs, metals, PCBs, and pesticides. Composite sample collected from 0-4 ftbg for TPHC DRO/GRO, RCRA Characteristicis, and TCLP RCRA metals. Soil was classified according to the Unified Soil Classification System (USCS).

PROJECT NO.: 15-008-0265

BORING NO.: SB-03

DRILLING SUMMARY

Geologist:
Eva Jakubowska

Drilling Company:
Cascade Technical Services, Ltd.

Driller:
Evan Moriatos

Rig Make/Model:
NA

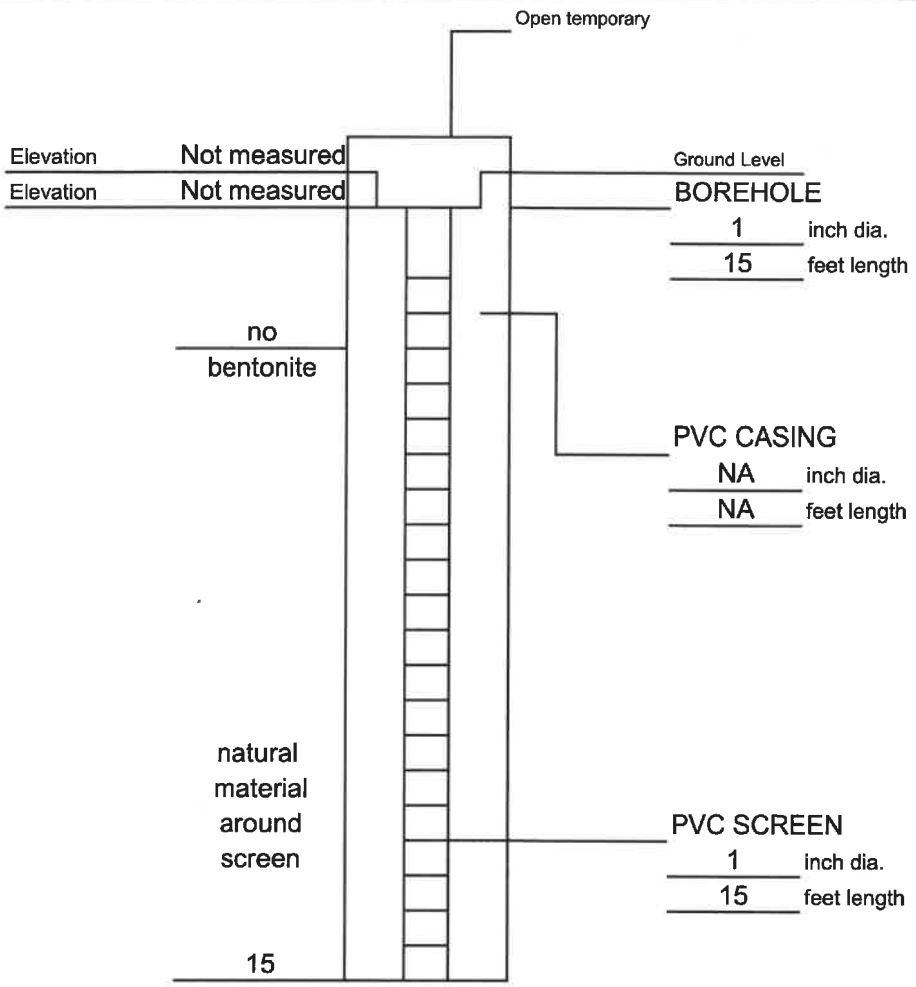
Date: 10/25/2016

GEOLOGIC LOG

Depth(ft.)	Description
	See Soil Boring Log

WELL DESIGN

TEMPORARY WELL CONSTRUCTION DETAIL



Not to Scale

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: None	Type: 1" PVC	Type: no filter pack Setting: N/A
Monitor: None	Slot Size: 0.010"	*SEAL MATERIAL* Type: Bentonite Setting: none Type: Cement Setting: NA

COMMENTS:
Temporary well.
Groundwater noted at approximately 9 ftbg.

Client:	**Location:**	**Project No.:**
NYCDDC- OEGS	Newtown Creek, Brooklyn, NY	15-008-0265
LiRo Engineers, Inc.	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** SB-02/TWP-02

APPENDIX C
LABORATORY ANALYTICAL DATA

Included on Attached CD

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

DATA FOR

VOLATILE ORGANICS

SEMI-VOLATILE ORGANICS

GC SEMI-VOLATILES

METALS

GENERAL CHEMISTRY

PROJECT NAME : DDC- NEWTOWN CREEK NATURE WALK

LIRO ENGINEERS, INC.

690 Delaware Ave.

Buffalo, NY - 14209

Phone No: 716-882-5476

ORDER ID : H5411

ATTENTION : -

ACCREDITED IN ACCORDANCE WITH nelac

DoD ELAP

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Date : 11/01/2016

Dear -,

7 water and **8** soil samples for the **DDC- Newtown Creek Nature Walk** project were received on **10/25/2016.** The analytical fax results for those samples requested for an expedited turn around time may be seen in this report. Please contact me if you have any questions or concerns regarding this report.

The invoice for this workorder is also attached to the e-mail.

Regards,

Loreana Davi

Loreana@chemtech.net

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. H5411
QUOTE NO.
COC Number 038358

CLIENT INFORMATION
REPORT TO BE SENT TO:
COMPANY: LiRO Engineers, Inc.
ADDRESS: 703 Corinier Street
CITY: Brooklyn STATE: NY ZIP: 11211
ATTENTION: Amy Hewson
PHONE: 716 882 5476 FAX: —

CLIENT PROJECT INFORMATION
PROJECT NAME: Newtown Creek Nature Walk
PROJECT NO.: 15-008-0265 LOCATION: Brooklyn
PROJECT MANAGER: Amy Hewson
e-mail: hewsona@lir0.com
PHONE: — FAX: —

CLIENT BILLING INFORMATION
BILL TO: PO#:
ADDRESS: same
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION
FAX: DAYS *
HARD COPY: DAYS *
EDD: 5 day TAT DAYS *
PREAPPROVED TAT: ☑ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION
☑ LEVEL 1: Results only ☐ Others
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format:

ANALYSIS
1 TCL VOCs 8260B
2 SVOCs 8270C
3 PCBs 3550B/8082
4 Pesticides 8081
5 TAL Metals *
6 NYCDEP sanitary & combined sewer Discharg. parameters
7
8
9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	TWP-02	GW		X	10.25.16	0930	20	X	X	X	X	X	X	X			
2.	TWP-02 DUP	GW		X	↓	0940	6	X	X	X	X	X					
3.	EQUIP. Blank	DI		X	↓	0950	6	X	X	X	X	X					
4.	Trip Blank	DI		X	—	—	2	X									
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

Preservatives: A-HCl B-HNO_3 C-H_2SO_4 D-NaOH E-ICE F-Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

	RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY
1.	Eva	10/25/16	Jonathan Rivera
2.			
3.		1755	C. Rivera

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant Cooler Temp. 6.0
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments: * TAL metals: Filtered & UnFiltered (Lab to Filter)
Ice in Cooler?:

Page 2 of 2

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT
Shipment Complete: ☐ YES ☐ NO

Revision 8/2007

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. 45211
QUOTE NO.
COC Number 042999

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: LIRO Engineers, Inc.
ADDRESS: 703 Lorimer Street
CITY: Brooklyn STATE: NY ZIP: 11211
ATTENTION: Amy Hewson
PHONE: 718 882 5476 FAX: —

CLIENT PROJECT INFORMATION

PROJECT NAME: Newtown Creek Nature Walk
PROJECT NO.: 15-008-0265 LOCATION: Brooklyn NY
PROJECT MANAGER: Amy Hewson
e-mail: hewsona@liro.com
PHONE: — FAX: —

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS: same
CITY: STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX: _____ DAYS *
HARD COPY: _____ DAYS *
EDD: 5 day TAT as per contract DAYS *
PREAPPROVED TAT: ☑ YES ☐ NO
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

☑ LEVEL 1: Results only ☐ Others _____
☐ LEVEL 2: Results + QC
☐ LEVEL 3: Results (plus results raw data) + QC
☐ LEVEL 4: Results + QC (all raw data)
☐ EDD Format: _____

ANALYSIS

1 TCL VOCs 8260B
2 SVOCs 8270C
3 PCBs
4 Pesticides
5 TAL Metals
6 TPHC DRO/GRO
7 RCRA characteristics
8 TCLP RCRA Metals
9

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	PRESERVATIVES 1	2	3	4	5	6	7	8	9	COMMENTS
1.	SB-01-5.5-6.0	soil		X	10/24/16	1315	2	X	X	X	X	X					
2.	SB-01-5.5-6.0 DUP			X		B20	2	X	X	X	X	X					
3.	SB-01-COMP		X			1325	2						X	X	X		
4.	SB-02-0-2.0'			X	10/25/16	0830	2	X	X	X	X	X					
5.	SB-02-8.5-9.0'			X		0850	2	X	X	X	X	X					
6.	SB-02-COMP		X			0900	2						X	X	X		
7.	SB-03-3.5-4.0'			X		1050	2	X	X	X	X	X					
8.	SB-03-COMP		X			1100	2						X	X	X		
9.																	
10.																	

PRESERVATIVES: E

← Specify Preservatives
A – HCl B – HNO_3
C – H_2SO_4 D – NaOH
E – ICE F – Other

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

	RELINQUISHED BY SAMPLER	DATE/TIME	RECEIVED BY
1.	[signature]	10/25/16	[signature]
2.	RELINQUISHED BY	DATE/TIME:	RECEIVED BY:
3.	[signature]	10/25/16 1358	RECEIVED FOR LAB BY: [signature]

Conditions of bottles or coolers at receipt: ☐ Compliant ☐ Non Compliant Cooler Temp. 6.0
MeOH extraction requires an additional 4 oz jar for percent solid.
Comments:
Ice in Cooler?: _____

Page 1 of 2

SHIPPED VIA: CLIENT: ☐ HAND DELIVERED ☐ OVERNIGHT
CHEMTECH: ☑ PICKED UP ☐ OVERNIGHT

Shipment Complete: ☐ YES ☐ NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Level (low/med):	low	% Solid:	84.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	5310		1	0.824	1.23	4.9	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-36-0	Antimony	7.74		1	0.549	0.613	2.45	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-38-2	Arsenic	16.6		1	0.245	0.245	0.98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-39-3	Barium	184		1	0.392	1.23	4.9	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-41-7	Beryllium	0.259	J	1	0.059	0.074	0.294	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-43-9	Cadmium	0.254	J	1	0.059	0.074	0.294	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-70-2	Calcium	9100		1	1.05	24.5	98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-47-3	Chromium	21.6		1	0.123	0.123	0.49	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-48-4	Cobalt	9.04		1	0.368	0.368	1.47	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-50-8	Copper	247		1	0.245	0.245	0.98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7439-89-6	Iron	27300		1	1.23	1.23	4.9	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7439-92-1	Lead	572		1	0.118	0.245	0.588	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7439-95-4	Magnesium	1710		1	4.49	24.5	98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7439-96-5	Manganese	307		1	0.186	0.245	0.98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7439-97-6	Mercury	0.733		1	0.008	0.008	0.015	mg/Kg	10/27/16 15:55	10/28/16 13:54	SW7471A
7440-02-0	Nickel	20.4		1	0.451	0.49	1.96	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-09-7	Potassium	675		1	3.43	24.5	98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7782-49-2	Selenium	7.43		1	0.245	0.245	0.98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-22-4	Silver	0.123	U	1	0.123	0.123	0.49	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-23-5	Sodium	354		1	2.47	24.5	98	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-28-0	Thallium	0.628	J	1	0.265	0.49	1.96	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-62-2	Vanadium	23.1		1	0.49	0.49	1.96	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010
7440-66-6	Zinc	322		1	0.49	0.49	1.96	mg/Kg	10/27/16 11:24	10/27/16 15:33	SW6010

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	15.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030809.D	1	10/27/16 11:26	11/01/16 13:56	PB94339

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	20.1	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	20.1	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	20.1	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	20.1	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	20.1	ug/kg
11097-69-1	Aroclor-1254	3.9	U	1.8	3.9	20.1	ug/kg
37324-23-5	Aroclor-1262	3.9	U	3.9	3.9	20.1	ug/kg
11100-14-4	Aroclor-1268	3.9	U	3.9	3.9	20.1	ug/kg
11096-82-5	Aroclor-1260	87.9	P	3.9	3.9	20.1	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	29.9		10 - 166		150%	SPK: 20
2051-24-3	Decachlorobiphenyl	14		60 - 125		70%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021022.D	1	10/27/16 11:23	10/28/16 12:20	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.39	U	0.154	0.39	2	ug/kg
319-85-7	beta-BHC	0.39	U	0.213	0.39	2	ug/kg
319-86-8	delta-BHC	0.39	U	0.118	0.39	2	ug/kg
58-89-9	gamma-BHC (Lindane)	0.39	U	0.177	0.39	2	ug/kg
76-44-8	Heptachlor	0.39	U	0.166	0.39	2	ug/kg
309-00-2	Aldrin	0.39	U	0.118	0.39	2	ug/kg
1024-57-3	Heptachlor epoxide	0.39	U	0.189	0.39	2	ug/kg
959-98-8	Endosulfan I	0.39	U	0.177	0.39	2	ug/kg
60-57-1	Dieldrin	0.39	U	0.154	0.39	2	ug/kg
72-55-9	4,4-DDE	0.39	U	0.236	0.39	2	ug/kg
72-20-8	Endrin	0.39	U	0.213	0.39	2	ug/kg
33213-65-9	Endosulfan II	0.39	U	0.166	0.39	2	ug/kg
72-54-8	4,4-DDD	0.39	U	0.201	0.39	2	ug/kg
1031-07-8	Endosulfan Sulfate	0.39	U	0.177	0.39	2	ug/kg
50-29-3	4,4-DDT	0.39	U	0.166	0.39	2	ug/kg
72-43-5	Methoxychlor	0.39	U	0.201	0.39	2	ug/kg
53494-70-5	Endrin ketone	0.39	U	0.154	0.39	2	ug/kg
7421-93-4	Endrin aldehyde	0.39	U	0.177	0.39	2	ug/kg
5103-71-9	alpha-Chlordane	0.39	U	0.166	0.39	2	ug/kg
5103-74-2	gamma-Chlordane	0.39	U	0.154	0.39	2	ug/kg
8001-35-2	Toxaphene	3.9	U	3.9	3.9	20.1	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	7.64		10 - 169		38%	SPK: 20
877-09-8	Tetrachloro-m-xylene	5.14	*	31 - 151		26%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021022.D	1	10/27/16 11:23	10/28/16 12:20	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-01RE	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021023.D	1	10/27/16 11:23	10/28/16 12:41	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.39	U	0.154	0.39	2	ug/kg
319-85-7	beta-BHC	0.39	U	0.213	0.39	2	ug/kg
319-86-8	delta-BHC	0.39	U	0.118	0.39	2	ug/kg
58-89-9	gamma-BHC (Lindane)	0.39	U	0.177	0.39	2	ug/kg
76-44-8	Heptachlor	0.39	U	0.166	0.39	2	ug/kg
309-00-2	Aldrin	0.39	U	0.118	0.39	2	ug/kg
1024-57-3	Heptachlor epoxide	0.39	U	0.189	0.39	2	ug/kg
959-98-8	Endosulfan I	0.39	U	0.177	0.39	2	ug/kg
60-57-1	Dieldrin	0.39	U	0.154	0.39	2	ug/kg
72-55-9	4,4-DDE	0.39	U	0.236	0.39	2	ug/kg
72-20-8	Endrin	0.39	U	0.213	0.39	2	ug/kg
33213-65-9	Endosulfan II	0.39	U	0.166	0.39	2	ug/kg
72-54-8	4,4-DDD	0.39	U	0.201	0.39	2	ug/kg
1031-07-8	Endosulfan Sulfate	0.39	U	0.177	0.39	2	ug/kg
50-29-3	4,4-DDT	0.39	U	0.166	0.39	2	ug/kg
72-43-5	Methoxychlor	0.39	U	0.201	0.39	2	ug/kg
53494-70-5	Endrin ketone	0.39	U	0.154	0.39	2	ug/kg
7421-93-4	Endrin aldehyde	0.39	U	0.177	0.39	2	ug/kg
5103-71-9	alpha-Chlordane	0.39	U	0.166	0.39	2	ug/kg
5103-74-2	gamma-Chlordane	0.39	U	0.154	0.39	2	ug/kg
8001-35-2	Toxaphene	3.9	U	3.9	3.9	20.1	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	7.88		10 - 169		39%	SPK: 20
877-09-8	Tetrachloro-m-xylene	5.2	*	31 - 151		26%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-01RE	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021023.D	1	10/27/16 11:23	10/28/16 12:41	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.7
Sample Wt/Vol:	30.06 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090907.D	5	10/27/16 12:27	10/28/16 13:54	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	200	U	100	200	2000	ug/Kg
108-95-2	Phenol	200	U	45.6	200	2000	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	200	U	94.7	200	2000	ug/Kg
95-57-8	2-Chlorophenol	200	U	100	200	2000	ug/Kg
95-48-7	2-Methylphenol	200	U	110	200	2000	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	200	U	81.7	200	2000	ug/Kg
98-86-2	Acetophenone	200	U	60.4	200	2000	ug/Kg
65794-96-9	3+4-Methylphenols	200	U	100	200	2000	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	200	U	99.4	200	2000	ug/Kg
67-72-1	Hexachloroethane	200	U	88.2	200	2000	ug/Kg
98-95-3	Nitrobenzene	200	U	74.6	200	2000	ug/Kg
78-59-1	Isophorone	200	U	65.1	200	2000	ug/Kg
88-75-5	2-Nitrophenol	200	U	95.3	200	2000	ug/Kg
105-67-9	2,4-Dimethylphenol	200	U	110	200	2000	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	200	U	110	200	2000	ug/Kg
120-83-2	2,4-Dichlorophenol	200	U	75.2	200	2000	ug/Kg
91-20-3	Naphthalene	200	U	68.1	200	2000	ug/Kg
106-47-8	4-Chloroaniline	200	U	140	200	2000	ug/Kg
87-68-3	Hexachlorobutadiene	200	U	71.6	200	2000	ug/Kg
105-60-2	Caprolactam	390	U	91.8	390	2000	ug/Kg
59-50-7	4-Chloro-3-methylphenol	200	U	87.6	200	2000	ug/Kg
91-57-6	2-Methylnaphthalene	200	U	49.7	200	2000	ug/Kg
77-47-4	Hexachlorocyclopentadiene	200	U	47.9	200	2000	ug/Kg
88-06-2	2,4,6-Trichlorophenol	200	U	60.4	200	2000	ug/Kg
95-95-4	2,4,5-Trichlorophenol	200	U	140	200	2000	ug/Kg
92-52-4	1,1-Biphenyl	200	U	74.6	200	2000	ug/Kg
91-58-7	2-Chloronaphthalene	200	U	45	200	2000	ug/Kg
88-74-4	2-Nitroaniline	200	U	87.6	200	2000	ug/Kg
131-11-3	Dimethylphthalate	520	J	53.3	200	2000	ug/Kg
208-96-8	Acenaphthylene	200	U	49.7	200	2000	ug/Kg
606-20-2	2,6-Dinitrotoluene	200	U	80.5	200	2000	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.7
Sample Wt/Vol:	30.06 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090907.D	5	10/27/16 12:27	10/28/16 13:54	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	390	U	130	390	2000	ug/Kg
83-32-9	Acenaphthene	200	U	55.6	200	2000	ug/Kg
51-28-5	2,4-Dinitrophenol	1600	U	200	1600	2000	ug/Kg
100-02-7	4-Nitrophenol	990	U	370	990	2000	ug/Kg
132-64-9	Dibenzofuran	200	U	77	200	2000	ug/Kg
121-14-2	2,4-Dinitrotoluene	200	U	59.2	200	2000	ug/Kg
84-66-2	Diethylphthalate	200	U	30.8	200	2000	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	200	U	110	200	2000	ug/Kg
86-73-7	Fluorene	200	U	74.6	200	2000	ug/Kg
100-01-6	4-Nitroaniline	390	U	260	390	2000	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	990	U	110	990	2000	ug/Kg
86-30-6	n-Nitrosodiphenylamine	200	U	47.4	200	2000	ug/Kg
101-55-3	4-Bromophenyl-phenylether	200	U	38.5	200	2000	ug/Kg
118-74-1	Hexachlorobenzene	200	U	80.5	200	2000	ug/Kg
1912-24-9	Atrazine	200	U	100	200	2000	ug/Kg
87-86-5	Pentachlorophenol	200	U	130	200	2000	ug/Kg
85-01-8	Phenanthrene	3400		53.3	200	2000	ug/Kg
120-12-7	Anthracene	820	J	40.3	200	2000	ug/Kg
86-74-8	Carbazole	200	U	43.2	200	2000	ug/Kg
84-74-2	Di-n-butylphthalate	200	U	160	200	2000	ug/Kg
206-44-0	Fluoranthene	3400		39.7	200	2000	ug/Kg
129-00-0	Pyrene	3100		47.4	200	2000	ug/Kg
85-68-7	Butylbenzylphthalate	200	U	94.7	200	2000	ug/Kg
91-94-1	3,3-Dichlorobenzidine	200	U	130	200	2000	ug/Kg
56-55-3	Benzo(a)anthracene	2000		94.1	200	2000	ug/Kg
218-01-9	Chrysene	1800	J	89.4	200	2000	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	200	U	69.8	200	2000	ug/Kg
117-84-0	Di-n-octyl phthalate	200	U	22.5	200	2000	ug/Kg
205-99-2	Benzo(b)fluoranthene	1700	J	64.5	200	2000	ug/Kg
207-08-9	Benzo(k)fluoranthene	890	J	92.9	200	2000	ug/Kg
50-32-8	Benzo(a)pyrene	1600	J	42.6	200	2000	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	900	J	65.7	200	2000	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	200	U	56.8	200	2000	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.7
Sample Wt/Vol:	30.06 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090907.D	5	10/27/16 12:27	10/28/16 13:54	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	850	J	79.9	200	2000	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	200	U	77.5	200	2000	ug/Kg
123-91-1	1,4-Dioxane	390	U	77.5	390	2000	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	200	U	77.5	200	2000	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	75.5		28 - 127		50%	SPK: 150
13127-88-3	Phenol-d6	80		34 - 127		53%	SPK: 150
4165-60-0	Nitrobenzene-d5	61.5		31 - 132		62%	SPK: 100
321-60-8	2-Fluorobiphenyl	48.4		39 - 123		48%	SPK: 100
118-79-6	2,4,6-Tribromophenol	34.4	*	30 - 133		23%	SPK: 150
1718-51-0	Terphenyl-d14	29.8	*	37 - 115		30%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	198918	6.76				
1146-65-2	Naphthalene-d8	777839	8.05				
15067-26-2	Acenaphthene-d10	374794	9.8				
1517-22-2	Phenanthrene-d10	502947	11.29				
1719-03-5	Chrysene-d12	448039	13.93				
1520-96-3	Perylene-d12	465498	15.33				
TENTATIVE IDENTIFIED COMPOUNDS							
000123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	520	A			4.9	ug/Kg
	unknown6.52	2200	J			6.52	ug/Kg
000203-64-5	4H-Cyclopenta[def]phenanthrene	560	J			11.89	ug/Kg
003442-78-2	Pyrene, 2-methyl-	430	J			13.05	ug/Kg
000192-97-2	Benzo[e]pyrene	950	J			15.22	ug/Kg

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LOD = Limit of Detection
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051280.D	1		10/27/16 13:15	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.59	U	0.59	0.59	5.9	ug/Kg
74-87-3	Chloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-01-4	Vinyl Chloride	0.59	U	0.59	0.59	5.9	ug/Kg
74-83-9	Bromomethane	1.2	U	1.2	1.2	5.9	ug/Kg
75-00-3	Chloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-69-4	Trichlorofluoromethane	0.59	U	0.59	0.59	5.9	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-35-4	1,1-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
67-64-1	Acetone	3	U	3	3	29.7	ug/Kg
75-15-0	Carbon Disulfide	0.59	U	0.59	0.59	5.9	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.59	U	0.59	0.59	5.9	ug/Kg
79-20-9	Methyl Acetate	1.2	U	1.2	1.2	5.9	ug/Kg
75-09-2	Methylene Chloride	3.1	J	0.59	0.59	5.9	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
75-34-3	1,1-Dichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
110-82-7	Cyclohexane	0.59	U	0.59	0.59	5.9	ug/Kg
78-93-3	2-Butanone	8.9	U	3.7	8.9	29.7	ug/Kg
56-23-5	Carbon Tetrachloride	0.59	U	0.59	0.59	5.9	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
74-97-5	Bromochloromethane	1.3	J	0.59	0.59	5.9	ug/Kg
67-66-3	Chloroform	0.59	U	0.59	0.59	5.9	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
108-87-2	Methylcyclohexane	0.59	U	0.59	0.59	5.9	ug/Kg
71-43-2	Benzene	0.59	U	0.45	0.59	5.9	ug/Kg
107-06-2	1,2-Dichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
79-01-6	Trichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
78-87-5	1,2-Dichloropropane	0.59	U	0.31	0.59	5.9	ug/Kg
75-27-4	Bromodichloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
108-10-1	4-Methyl-2-Pentanone	3	U	3	3	29.7	ug/Kg
108-88-3	Toluene	0.59	U	0.59	0.59	5.9	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.59	U	0.59	0.59	5.9	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.59	U	0.59	0.59	5.9	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051280.D	1		10/27/16 13:15	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.2	U	1.1	1.2	5.9	ug/Kg
591-78-6	2-Hexanone	3	U	3	3	29.7	ug/Kg
124-48-1	Dibromochloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
106-93-4	1,2-Dibromoethane	0.59	U	0.59	0.59	5.9	ug/Kg
127-18-4	Tetrachloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
108-90-7	Chlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
100-41-4	Ethyl Benzene	0.59	U	0.59	0.59	5.9	ug/Kg
179601-23-1	m/p-Xylenes	1.2	U	0.85	1.2	11.9	ug/Kg
95-47-6	o-Xylene	0.59	U	0.59	0.59	5.9	ug/Kg
100-42-5	Styrene	0.59	U	0.53	0.59	5.9	ug/Kg
75-25-2	Bromoform	1.8	U	0.88	1.8	5.9	ug/Kg
98-82-8	Isopropylbenzene	0.59	U	0.57	0.59	5.9	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.59	U	0.55	0.59	5.9	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.59	U	0.44	0.59	5.9	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.59	U	0.49	0.59	5.9	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.9	U	1	5.9	5.9	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.59	1.2	5.9	ug/Kg
123-91-1	1,4-Dioxane	120	U	120	120	120	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	38.4		56 - 120		77%	SPK: 50
1868-53-7	Dibromofluoromethane	41.4		57 - 135		83%	SPK: 50
2037-26-5	Toluene-d8	39.7		67 - 123		79%	SPK: 50
460-00-4	4-Bromofluorobenzene	32.1		33 - 141		64%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	646621	4.76				
540-36-3	1,4-Difluorobenzene	979474	5.49				
3114-55-4	Chlorobenzene-d5	843184	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	257382	12.46				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0	SDG No.:	H5411
Lab Sample ID:	H5411-01	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051280.D	1		10/27/16 13:15	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Level (low/med):	low	% Solid:	84.5

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	5060		1	0.861	1.28	5.12	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-36-0	Antimony	30.4		1	0.574	0.64	2.56	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-38-2	Arsenic	18.2		1	0.256	0.256	1.02	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-39-3	Barium	202		1	0.41	1.28	5.12	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-41-7	Beryllium	0.27	J	1	0.061	0.077	0.307	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-43-9	Cadmium	0.343		1	0.061	0.077	0.307	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-70-2	Calcium	8080		1	1.1	25.6	102	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-47-3	Chromium	19.2		1	0.128	0.128	0.512	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-48-4	Cobalt	7.28		1	0.384	0.384	1.54	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-50-8	Copper	266		1	0.256	0.256	1.02	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7439-89-6	Iron	30900		1	1.28	1.28	5.12	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7439-92-1	Lead	549		1	0.123	0.256	0.615	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7439-95-4	Magnesium	1340		1	4.69	25.6	102	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7439-96-5	Manganese	293		1	0.195	0.256	1.02	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7439-97-6	Mercury	0.681		1	0.007	0.007	0.014	mg/Kg	10/27/16 15:55	10/28/16 13:57	SW7471A
7440-02-0	Nickel	20		1	0.471	0.512	2.05	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-09-7	Potassium	611		1	3.59	25.6	102	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7782-49-2	Selenium	8.65		1	0.256	0.256	1.02	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-22-4	Silver	0.128	U	1	0.128	0.128	0.512	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-23-5	Sodium	330		1	2.58	25.6	102	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-28-0	Thallium	0.726	J	1	0.277	0.512	2.05	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-62-2	Vanadium	20.6		1	0.512	0.512	2.05	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010
7440-66-6	Zinc	344		1	0.512	0.512	2.05	mg/Kg	10/27/16 11:24	10/27/16 16:33	SW6010

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	15.5 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030810.D	1	10/27/16 11:26	11/01/16 14:12	PB94339

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	20.1	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	20.1	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	20.1	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	20.1	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	20.1	ug/kg
11097-69-1	Aroclor-1254	3.9	U	1.8	3.9	20.1	ug/kg
37324-23-5	Aroclor-1262	3.9	U	3.9	3.9	20.1	ug/kg
11100-14-4	Aroclor-1268	3.9	U	3.9	3.9	20.1	ug/kg
11096-82-5	Aroclor-1260	62.9	P	3.9	3.9	20.1	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	24		10 - 166		120%	SPK: 20
2051-24-3	Decachlorobiphenyl	11.1	*	60 - 125		55%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.5 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021010.D	1	10/27/16 11:23	10/27/16 23:22	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.39	U	0.154	0.39	2	ug/kg
319-85-7	beta-BHC	0.39	U	0.213	0.39	2	ug/kg
319-86-8	delta-BHC	0.39	U	0.118	0.39	2	ug/kg
58-89-9	gamma-BHC (Lindane)	3.8		0.177	0.39	2	ug/kg
76-44-8	Heptachlor	0.39	U	0.166	0.39	2	ug/kg
309-00-2	Aldrin	0.39	U	0.118	0.39	2	ug/kg
1024-57-3	Heptachlor epoxide	0.39	U	0.189	0.39	2	ug/kg
959-98-8	Endosulfan I	0.39	U	0.177	0.39	2	ug/kg
60-57-1	Dieldrin	0.39	U	0.154	0.39	2	ug/kg
72-55-9	4,4-DDE	0.39	U	0.236	0.39	2	ug/kg
72-20-8	Endrin	0.39	U	0.213	0.39	2	ug/kg
33213-65-9	Endosulfan II	0.39	U	0.166	0.39	2	ug/kg
72-54-8	4,4-DDD	0.39	U	0.201	0.39	2	ug/kg
1031-07-8	Endosulfan Sulfate	0.39	U	0.177	0.39	2	ug/kg
50-29-3	4,4-DDT	0.39	U	0.166	0.39	2	ug/kg
72-43-5	Methoxychlor	0.39	U	0.201	0.39	2	ug/kg
53494-70-5	Endrin ketone	0.39	U	0.154	0.39	2	ug/kg
7421-93-4	Endrin aldehyde	0.39	U	0.177	0.39	2	ug/kg
5103-71-9	alpha-Chlordane	0.39	U	0.166	0.39	2	ug/kg
5103-74-2	gamma-Chlordane	0.39	U	0.154	0.39	2	ug/kg
8001-35-2	Toxaphene	3.9	U	3.9	3.9	20.1	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	10.2		10 - 169		51%	SPK: 20
877-09-8	Tetrachloro-m-xylene	13		31 - 151		65%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	15.5 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021010.D	1	10/27/16 11:23	10/27/16 23:22	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.5
Sample Wt/Vol:	30.03 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090908.D	10	10/27/16 12:27	10/28/16 14:21	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	390	U	210	390	3900	ug/Kg
108-95-2	Phenol	390	U	91	390	3900	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	390	U	190	390	3900	ug/Kg
95-57-8	2-Chlorophenol	390	U	210	390	3900	ug/Kg
95-48-7	2-Methylphenol	390	U	210	390	3900	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	390	U	160	390	3900	ug/Kg
98-86-2	Acetophenone	390	U	120	390	3900	ug/Kg
65794-96-9	3+4-Methylphenols	390	U	200	390	3900	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	390	U	200	390	3900	ug/Kg
67-72-1	Hexachloroethane	390	U	180	390	3900	ug/Kg
98-95-3	Nitrobenzene	390	U	150	390	3900	ug/Kg
78-59-1	Isophorone	390	U	130	390	3900	ug/Kg
88-75-5	2-Nitrophenol	390	U	190	390	3900	ug/Kg
105-67-9	2,4-Dimethylphenol	390	U	220	390	3900	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	390	U	230	390	3900	ug/Kg
120-83-2	2,4-Dichlorophenol	390	U	150	390	3900	ug/Kg
91-20-3	Naphthalene	390	U	140	390	3900	ug/Kg
106-47-8	4-Chloroaniline	390	U	280	390	3900	ug/Kg
87-68-3	Hexachlorobutadiene	390	U	140	390	3900	ug/Kg
105-60-2	Caprolactam	790	U	180	790	3900	ug/Kg
59-50-7	4-Chloro-3-methylphenol	390	U	170	390	3900	ug/Kg
91-57-6	2-Methylnaphthalene	390	U	99.3	390	3900	ug/Kg
77-47-4	Hexachlorocyclopentadiene	390	U	95.8	390	3900	ug/Kg
88-06-2	2,4,6-Trichlorophenol	390	U	120	390	3900	ug/Kg
95-95-4	2,4,5-Trichlorophenol	390	U	280	390	3900	ug/Kg
92-52-4	1,1-Biphenyl	390	U	150	390	3900	ug/Kg
91-58-7	2-Chloronaphthalene	390	U	89.9	390	3900	ug/Kg
88-74-4	2-Nitroaniline	390	U	170	390	3900	ug/Kg
131-11-3	Dimethylphthalate	390	U	110	390	3900	ug/Kg
208-96-8	Acenaphthylene	390	U	99.3	390	3900	ug/Kg
606-20-2	2,6-Dinitrotoluene	390	U	160	390	3900	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.5
Sample Wt/Vol:	30.03 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090908.D	10	10/27/16 12:27	10/28/16 14:21	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	790	U	250	790	3900	ug/Kg
83-32-9	Acenaphthene	960	J	110	390	3900	ug/Kg
51-28-5	2,4-Dinitrophenol	3200	U	400	3200	3900	ug/Kg
100-02-7	4-Nitrophenol	2000	U	730	2000	3900	ug/Kg
132-64-9	Dibenzofuran	870	J	150	390	3900	ug/Kg
121-14-2	2,4-Dinitrotoluene	390	U	120	390	3900	ug/Kg
84-66-2	Diethylphthalate	390	U	61.5	390	3900	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	390	U	210	390	3900	ug/Kg
86-73-7	Fluorene	1300	J	150	390	3900	ug/Kg
100-01-6	4-Nitroaniline	790	U	510	790	3900	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	2000	U	230	2000	3900	ug/Kg
86-30-6	n-Nitrosodiphenylamine	390	U	94.6	390	3900	ug/Kg
101-55-3	4-Bromophenyl-phenylether	390	U	76.8	390	3900	ug/Kg
118-74-1	Hexachlorobenzene	390	U	160	390	3900	ug/Kg
1912-24-9	Atrazine	390	U	210	390	3900	ug/Kg
87-86-5	Pentachlorophenol	390	U	270	390	3900	ug/Kg
85-01-8	Phenanthrene	9200		110	390	3900	ug/Kg
120-12-7	Anthracene	2100	J	80.4	390	3900	ug/Kg
86-74-8	Carbazole	390	U	86.3	390	3900	ug/Kg
84-74-2	Di-n-butylphthalate	390	U	310	390	3900	ug/Kg
206-44-0	Fluoranthene	7300		79.2	390	3900	ug/Kg
129-00-0	Pyrene	8300		94.6	390	3900	ug/Kg
85-68-7	Butylbenzylphthalate	390	U	190	390	3900	ug/Kg
91-94-1	3,3-Dichlorobenzidine	390	U	250	390	3900	ug/Kg
56-55-3	Benzo(a)anthracene	3800	J	190	390	3900	ug/Kg
218-01-9	Chrysene	3200	J	180	390	3900	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	390	U	140	390	3900	ug/Kg
117-84-0	Di-n-octyl phthalate	390	U	44.9	390	3900	ug/Kg
205-99-2	Benzo(b)fluoranthene	2900	J	130	390	3900	ug/Kg
207-08-9	Benzo(k)fluoranthene	1500	J	190	390	3900	ug/Kg
50-32-8	Benzo(a)pyrene	2800	J	85.1	390	3900	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	1800	J	130	390	3900	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	390	U	110	390	3900	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	15.5
Sample Wt/Vol:	30.03 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090908.D	10	10/27/16 12:27	10/28/16 14:21	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	1700	J	160	390	3900	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	390	U	150	390	3900	ug/Kg
123-91-1	1,4-Dioxane	790	U	150	790	3900	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	390	U	150	390	3900	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	90.6		28 - 127		60%	SPK: 150
13127-88-3	Phenol-d6	96.8		34 - 127		65%	SPK: 150
4165-60-0	Nitrobenzene-d5	72		31 - 132		72%	SPK: 100
321-60-8	2-Fluorobiphenyl	62.6		39 - 123		63%	SPK: 100
118-79-6	2,4,6-Tribromophenol	47.1		30 - 133		31%	SPK: 150
1718-51-0	Terphenyl-d14	55.1		37 - 115		55%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	208478	6.76				
1146-65-2	Naphthalene-d8	887608	8.05				
15067-26-2	Acenaphthene-d10	447335	9.8				
1517-22-2	Phenanthrene-d10	701725	11.29				
1719-03-5	Chrysene-d12	459505	13.93				
1520-96-3	Perylene-d12	447795	15.33				
TENTATIVE IDENTIFIED COMPOUNDS							
	unknown6.52	3000	J			6.52	ug/Kg
002531-84-2	Phenanthrene, 2-methyl-	880	J			11.81	ug/Kg
000203-64-5	4H-Cyclopenta[def]phenanthrene	1700	J			11.89	ug/Kg
000243-17-4	11H-Benzo[b]fluorene	870	J			13.05	ug/Kg
000050-32-8	Benzo[a]pyrene	1700	J			15.21	ug/Kg

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.5
Sample Wt/Vol:	4.98 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051266.D	1		10/26/16 16:05	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.59	U	0.59	0.59	5.9	ug/Kg
74-87-3	Chloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-01-4	Vinyl Chloride	0.59	U	0.59	0.59	5.9	ug/Kg
74-83-9	Bromomethane	1.2	U	1.2	1.2	5.9	ug/Kg
75-00-3	Chloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-69-4	Trichlorofluoromethane	0.59	U	0.59	0.59	5.9	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.59	U	0.59	0.59	5.9	ug/Kg
75-35-4	1,1-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
67-64-1	Acetone	3	U	3	3	29.7	ug/Kg
75-15-0	Carbon Disulfide	0.59	U	0.59	0.59	5.9	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.59	U	0.59	0.59	5.9	ug/Kg
79-20-9	Methyl Acetate	1.2	U	1.2	1.2	5.9	ug/Kg
75-09-2	Methylene Chloride	6.9		0.59	0.59	5.9	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
75-34-3	1,1-Dichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
110-82-7	Cyclohexane	0.59	U	0.59	0.59	5.9	ug/Kg
78-93-3	2-Butanone	8.9	U	3.7	8.9	29.7	ug/Kg
56-23-5	Carbon Tetrachloride	0.59	U	0.59	0.59	5.9	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
74-97-5	Bromochloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
67-66-3	Chloroform	1.7	J	0.59	0.59	5.9	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
108-87-2	Methylcyclohexane	0.59	U	0.59	0.59	5.9	ug/Kg
71-43-2	Benzene	0.59	U	0.45	0.59	5.9	ug/Kg
107-06-2	1,2-Dichloroethane	0.59	U	0.59	0.59	5.9	ug/Kg
79-01-6	Trichloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
78-87-5	1,2-Dichloropropane	0.59	U	0.31	0.59	5.9	ug/Kg
75-27-4	Bromodichloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
108-10-1	4-Methyl-2-Pentanone	3	U	3	3	29.7	ug/Kg
108-88-3	Toluene	0.59	U	0.59	0.59	5.9	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.59	U	0.59	0.59	5.9	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.59	U	0.59	0.59	5.9	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.5
Sample Wt/Vol:	4.98 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051266.D	1		10/26/16 16:05	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.2	U	1.1	1.2	5.9	ug/Kg
591-78-6	2-Hexanone	3	U	3	3	29.7	ug/Kg
124-48-1	Dibromochloromethane	0.59	U	0.59	0.59	5.9	ug/Kg
106-93-4	1,2-Dibromoethane	0.59	U	0.59	0.59	5.9	ug/Kg
127-18-4	Tetrachloroethene	0.59	U	0.59	0.59	5.9	ug/Kg
108-90-7	Chlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
100-41-4	Ethyl Benzene	0.59	U	0.59	0.59	5.9	ug/Kg
179601-23-1	m/p-Xylenes	1.2	U	0.86	1.2	11.9	ug/Kg
95-47-6	o-Xylene	0.59	U	0.59	0.59	5.9	ug/Kg
100-42-5	Styrene	0.59	U	0.53	0.59	5.9	ug/Kg
75-25-2	Bromoform	1.8	U	0.88	1.8	5.9	ug/Kg
98-82-8	Isopropylbenzene	0.59	U	0.57	0.59	5.9	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.59	U	0.55	0.59	5.9	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.59	U	0.44	0.59	5.9	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.59	U	0.49	0.59	5.9	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.9	U	1	5.9	5.9	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.59	U	0.59	0.59	5.9	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.59	1.2	5.9	ug/Kg
123-91-1	1,4-Dioxane	120	U	120	120	120	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	44.9		56 - 120		90%	SPK: 50
1868-53-7	Dibromofluoromethane	50.3		57 - 135		101%	SPK: 50
2037-26-5	Toluene-d8	45.5		67 - 123		91%	SPK: 50
460-00-4	4-Bromofluorobenzene	36		33 - 141		72%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	640256	4.77				
540-36-3	1,4-Difluorobenzene	947378	5.5				
3114-55-4	Chlorobenzene-d5	753095	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	256734	12.47				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-5.5-6.0-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-02	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	15.5
Sample Wt/Vol:	4.98 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051266.D	1		10/26/16 16:05	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16 13:25
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-03	Matrix:	SOIL
		% Solid:	85.3

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Corrosivity	8.65		1	0	0	0	pH		10/26/16 16:31	9045C
Ignitability	NO		1	0	0	0	oC		10/28/16 12:10	
Reactive Cyanide	0.05	U	1	0.05	0.05	0.05	mg/Kg	10/28/16 11:19	10/28/16 15:08	9012B
Reactive Sulfide	10	U	1	10	10	10	mg/Kg	10/29/16 10:20	10/29/16 13:06	9034

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-03	Matrix:	SOIL
Analytical Method:	8015B DRO	% Moisture:	14.7 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	1 mL
Soil Aliquot Vol:	uL	Test:	Diesel Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
FC024441.D	5	10/27/16 08:00	10/31/16 13:45	PB94336

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
DRO	DRO	81369		4880	4880	9760	ug/kg
SURROGATES							
16416-32-3	Tetracosane-d50	5.53	*	37 - 130		138%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-03	Matrix:	SOIL
Analytical Method:	8015B GRO	% Moisture:	14.7 Decanted:
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5 mL
Soil Aliquot Vol:	uL	Test:	Gasoline Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Date Analyzed	Prep Batch ID
FB007694.D	1	11/01/16 15:13	FB110116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
GRO	GRO	26.5	U	14	26.5	53	ug/kg
SURROGATES							
98-08-8	Alpha,Alpha,Alpha-Trifluoroto	16.5		50 - 150		83%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/24/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-01-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-03	Matrix:	TCLP
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	25	U	1	25	25.0	100	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7440-39-3	Barium	1540		1	40	125	500	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7440-43-9	Cadmium	30.9		1	5	7.5	30	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7440-47-3	Chromium	15.6	J	1	11	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7439-92-1	Lead	821		1	15	15.0	60	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7439-97-6	Mercury	1	U	1	1	1.0	2	ug/L	10/28/16 12:53	10/28/16 17:22	SW7470A
7782-49-2	Selenium	50	U	1	48	50.0	100	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010
7440-22-4	Silver	12.5	U	1	12.5	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:50	SW6010

Color Before:	Colorless	Clarity Before:		Texture:	Clear
Color After:	Colorless	Clarity After:		Artifacts:	Clear
Comments:	TCLP METALS				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Level (low/med):	low	% Solid:	89.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	5660		1	0.789	1.17	4.7	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-36-0	Antimony	1.45	J	1	0.526	0.587	2.35	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-38-2	Arsenic	14.7		1	0.235	0.235	0.94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-39-3	Barium	89.4		1	0.376	1.17	4.7	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-41-7	Beryllium	0.4		1	0.056	0.07	0.282	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-43-9	Cadmium	0.435		1	0.056	0.07	0.282	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-70-2	Calcium	26700		1	1.01	23.5	94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-47-3	Chromium	17.7		1	0.117	0.117	0.47	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-48-4	Cobalt	5.93		1	0.352	0.352	1.41	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-50-8	Copper	386		1	0.235	0.235	0.94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7439-89-6	Iron	16100		1	1.17	1.17	4.7	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7439-92-1	Lead	224		1	0.113	0.235	0.564	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7439-95-4	Magnesium	4130		1	4.3	23.5	94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7439-96-5	Manganese	168		1	0.179	0.235	0.94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7439-97-6	Mercury	0.288		1	0.007	0.007	0.014	mg/Kg	10/27/16 15:55	10/28/16 13:59	SW7471A
7440-02-0	Nickel	17.7		1	0.432	0.47	1.88	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-09-7	Potassium	848		1	3.29	23.5	94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7782-49-2	Selenium	1.85		1	0.235	0.235	0.94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-22-4	Silver	0.117	U	1	0.117	0.117	0.47	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-23-5	Sodium	196		1	2.37	23.5	94	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-28-0	Thallium	0.47	U	1	0.254	0.47	1.88	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-62-2	Vanadium	22.7		1	0.47	0.47	1.88	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010
7440-66-6	Zinc	273		1	0.47	0.47	1.88	mg/Kg	10/27/16 11:24	10/27/16 16:37	SW6010

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	10.2 Decanted:
Sample Wt/Vol:	30.15 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030740.D	1	10/27/16 11:26	10/27/16 19:21	PB94339

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
12674-11-2.	Aroclor-1016	3.7	U	3.7	3.7	18.8	ug/kg
11104-28-2	Aroclor-1221	3.7	U	3.7	3.7	18.8	ug/kg
11141-16-5	Aroclor-1232	3.7	U	3.7	3.7	18.8	ug/kg
53469-21-9	Aroclor-1242	3.7	U	3.7	3.7	18.8	ug/kg
12672-29-6	Aroclor-1248	3.7	U	3.7	3.7	18.8	ug/kg
11097-69-1	Aroclor-1254	3.7	U	1.7	3.7	18.8	ug/kg
37324-23-5	Aroclor-1262	3.7	U	3.7	3.7	18.8	ug/kg
11100-14-4	Aroclor-1268	3.7	U	3.7	3.7	18.8	ug/kg
11096-82-5	Aroclor-1260	43.5	P	3.7	3.7	18.8	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	18		10 - 166		90%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.5		60 - 125		77%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	10.2 Decanted:
Sample Wt/Vol:	30.15 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020990.D	1	10/27/16 11:23	10/27/16 18:47	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.366	U	0.144	0.366	1.9	ug/kg
319-85-7	beta-BHC	0.366	U	0.199	0.366	1.9	ug/kg
319-86-8	delta-BHC	0.366	U	0.111	0.366	1.9	ug/kg
58-89-9	gamma-BHC (Lindane)	0.366	U	0.166	0.366	1.9	ug/kg
76-44-8	Heptachlor	0.366	U	0.155	0.366	1.9	ug/kg
309-00-2	Aldrin	0.366	U	0.111	0.366	1.9	ug/kg
1024-57-3	Heptachlor epoxide	0.366	U	0.177	0.366	1.9	ug/kg
959-98-8	Endosulfan I	0.366	U	0.166	0.366	1.9	ug/kg
60-57-1	Dieldrin	0.366	U	0.144	0.366	1.9	ug/kg
72-55-9	4,4-DDE	0.366	U	0.222	0.366	1.9	ug/kg
72-20-8	Endrin	0.366	U	0.199	0.366	1.9	ug/kg
33213-65-9	Endosulfan II	0.366	U	0.155	0.366	1.9	ug/kg
72-54-8	4,4-DDD	0.366	U	0.188	0.366	1.9	ug/kg
1031-07-8	Endosulfan Sulfate	0.366	U	0.166	0.366	1.9	ug/kg
50-29-3	4,4-DDT	0.366	U	0.155	0.366	1.9	ug/kg
72-43-5	Methoxychlor	0.366	U	0.188	0.366	1.9	ug/kg
53494-70-5	Endrin ketone	0.366	U	0.144	0.366	1.9	ug/kg
7421-93-4	Endrin aldehyde	0.366	U	0.166	0.366	1.9	ug/kg
5103-71-9	alpha-Chlordane	0.366	U	0.155	0.366	1.9	ug/kg
5103-74-2	gamma-Chlordane	0.366	U	0.144	0.366	1.9	ug/kg
8001-35-2	Toxaphene	3.7	U	3.7	3.7	18.8	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	9.54		10 - 169		48%	SPK: 20
877-09-8	Tetrachloro-m-xylene	7.61		31 - 151		38%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	10.2 Decanted:
Sample Wt/Vol:	30.15 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020990.D	1	10/27/16 11:23	10/27/16 18:47	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	10.2
Sample Wt/Vol:	30.05 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090904.D	10	10/27/16 12:27	10/28/16 12:33	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	370	U	190	370	3700	ug/Kg
108-95-2	Phenol	370	U	85.6	370	3700	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	370	U	180	370	3700	ug/Kg
95-57-8	2-Chlorophenol	370	U	200	370	3700	ug/Kg
95-48-7	2-Methylphenol	370	U	200	370	3700	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	370	U	150	370	3700	ug/Kg
98-86-2	Acetophenone	370	U	110	370	3700	ug/Kg
65794-96-9	3+4-Methylphenols	370	U	190	370	3700	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	370	U	190	370	3700	ug/Kg
67-72-1	Hexachloroethane	370	U	170	370	3700	ug/Kg
98-95-3	Nitrobenzene	370	U	140	370	3700	ug/Kg
78-59-1	Isophorone	370	U	120	370	3700	ug/Kg
88-75-5	2-Nitrophenol	370	U	180	370	3700	ug/Kg
105-67-9	2,4-Dimethylphenol	370	U	210	370	3700	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	370	U	210	370	3700	ug/Kg
120-83-2	2,4-Dichlorophenol	370	U	140	370	3700	ug/Kg
91-20-3	Naphthalene	370	U	130	370	3700	ug/Kg
106-47-8	4-Chloroaniline	370	U	260	370	3700	ug/Kg
87-68-3	Hexachlorobutadiene	370	U	130	370	3700	ug/Kg
105-60-2	Caprolactam	740	U	170	740	3700	ug/Kg
59-50-7	4-Chloro-3-methylphenol	370	U	160	370	3700	ug/Kg
91-57-6	2-Methylnaphthalene	370	U	93.4	370	3700	ug/Kg
77-47-4	Hexachlorocyclopentadiene	370	U	90.1	370	3700	ug/Kg
88-06-2	2,4,6-Trichlorophenol	370	U	110	370	3700	ug/Kg
95-95-4	2,4,5-Trichlorophenol	370	U	260	370	3700	ug/Kg
92-52-4	1,1-Biphenyl	370	U	140	370	3700	ug/Kg
91-58-7	2-Chloronaphthalene	370	U	84.5	370	3700	ug/Kg
88-74-4	2-Nitroaniline	370	U	160	370	3700	ug/Kg
131-11-3	Dimethylphthalate	370	U	100	370	3700	ug/Kg
208-96-8	Acenaphthylene	370	U	93.4	370	3700	ug/Kg
606-20-2	2,6-Dinitrotoluene	370	U	150	370	3700	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	10.2
Sample Wt/Vol:	30.05 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090904.D	10	10/27/16 12:27	10/28/16 12:33	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	740	U	240	740	3700	ug/Kg
83-32-9	Acenaphthene	370	U	100	370	3700	ug/Kg
51-28-5	2,4-Dinitrophenol	3000	U	380	3000	3700	ug/Kg
100-02-7	4-Nitrophenol	1900	U	690	1900	3700	ug/Kg
132-64-9	Dibenzofuran	370	U	140	370	3700	ug/Kg
121-14-2	2,4-Dinitrotoluene	370	U	110	370	3700	ug/Kg
84-66-2	Diethylphthalate	370	U	57.8	370	3700	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	370	U	200	370	3700	ug/Kg
86-73-7	Fluorene	370	U	140	370	3700	ug/Kg
100-01-6	4-Nitroaniline	740	U	480	740	3700	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	1900	U	210	1900	3700	ug/Kg
86-30-6	n-Nitrosodiphenylamine	370	U	88.9	370	3700	ug/Kg
101-55-3	4-Bromophenyl-phenylether	370	U	72.3	370	3700	ug/Kg
118-74-1	Hexachlorobenzene	370	U	150	370	3700	ug/Kg
1912-24-9	Atrazine	370	U	200	370	3700	ug/Kg
87-86-5	Pentachlorophenol	370	U	250	370	3700	ug/Kg
85-01-8	Phenanthrene	2800	J	100	370	3700	ug/Kg
120-12-7	Anthracene	370	U	75.6	370	3700	ug/Kg
86-74-8	Carbazole	370	U	81.2	370	3700	ug/Kg
84-74-2	Di-n-butylphthalate	370	U	290	370	3700	ug/Kg
206-44-0	Fluoranthene	2700	J	74.5	370	3700	ug/Kg
129-00-0	Pyrene	3100	J	88.9	370	3700	ug/Kg
85-68-7	Butylbenzylphthalate	370	U	180	370	3700	ug/Kg
91-94-1	3,3-Dichlorobenzidine	370	U	240	370	3700	ug/Kg
56-55-3	Benzo(a)anthracene	1800	J	180	370	3700	ug/Kg
218-01-9	Chrysene	1500	J	170	370	3700	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	370	U	130	370	3700	ug/Kg
117-84-0	Di-n-octyl phthalate	370	U	42.2	370	3700	ug/Kg
205-99-2	Benzo(b)fluoranthene	1300	J	120	370	3700	ug/Kg
207-08-9	Benzo(k)fluoranthene	370	U	170	370	3700	ug/Kg
50-32-8	Benzo(a)pyrene	1400	J	80	370	3700	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	1200	J	120	370	3700	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	370	U	110	370	3700	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	10.2
Sample Wt/Vol:	30.05 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090904.D	10	10/27/16 12:27	10/28/16 12:33	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	1100	J	150	370	3700	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	370	U	150	370	3700	ug/Kg
123-91-1	1,4-Dioxane	740	U	150	740	3700	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	370	U	150	370	3700	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	73.2		28 - 127		49%	SPK: 150
13127-88-3	Phenol-d6	83.6		34 - 127		56%	SPK: 150
4165-60-0	Nitrobenzene-d5	60.8		31 - 132		61%	SPK: 100
321-60-8	2-Fluorobiphenyl	48.3		39 - 123		48%	SPK: 100
118-79-6	2,4,6-Tribromophenol	31.8	*	30 - 133		21%	SPK: 150
1718-51-0	Terphenyl-d14	41.4		37 - 115		41%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	199937	6.76				
1146-65-2	Naphthalene-d8	804734	8.05				
15067-26-2	Acenaphthene-d10	427039	9.8				
1517-22-2	Phenanthrene-d10	565607	11.29				
1719-03-5	Chrysene-d12	392099	13.92				
1520-96-3	Perylene-d12	451696	15.33				
TENTATIVE IDENTIFIED COMPOUNDS							
	unknown6.52	2100	J			6.52	ug/Kg
000205-99-2	Benz[e]acephenanthrylene	980	J			15.21	ug/Kg

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	4.99 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051268.D	1		10/26/16 17:02	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.56	U	0.56	0.56	5.6	ug/Kg
74-87-3	Chloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-01-4	Vinyl Chloride	0.56	U	0.56	0.56	5.6	ug/Kg
74-83-9	Bromomethane	1.1	U	1.1	1.1	5.6	ug/Kg
75-00-3	Chloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-69-4	Trichlorofluoromethane	0.56	U	0.56	0.56	5.6	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-35-4	1,1-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
67-64-1	Acetone	19.3	J	2.8	2.8	27.9	ug/Kg
75-15-0	Carbon Disulfide	0.56	U	0.56	0.56	5.6	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.56	U	0.56	0.56	5.6	ug/Kg
79-20-9	Methyl Acetate	1.1	U	1.1	1.1	5.6	ug/Kg
75-09-2	Methylene Chloride	7.5		0.56	0.56	5.6	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
75-34-3	1,1-Dichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
110-82-7	Cyclohexane	0.56	U	0.56	0.56	5.6	ug/Kg
78-93-3	2-Butanone	8.4	U	3.5	8.4	27.9	ug/Kg
56-23-5	Carbon Tetrachloride	0.56	U	0.56	0.56	5.6	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
74-97-5	Bromochloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
67-66-3	Chloroform	0.56	U	0.56	0.56	5.6	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
108-87-2	Methylcyclohexane	0.56	U	0.56	0.56	5.6	ug/Kg
71-43-2	Benzene	0.56	U	0.42	0.56	5.6	ug/Kg
107-06-2	1,2-Dichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
79-01-6	Trichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
78-87-5	1,2-Dichloropropane	0.56	U	0.29	0.56	5.6	ug/Kg
75-27-4	Bromodichloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
108-10-1	4-Methyl-2-Pentanone	2.8	U	2.8	2.8	27.9	ug/Kg
108-88-3	Toluene	0.56	U	0.56	0.56	5.6	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.56	U	0.56	0.56	5.6	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.56	U	0.56	0.56	5.6	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	4.99 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051268.D	1		10/26/16 17:02	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.1	U	1	1.1	5.6	ug/Kg
591-78-6	2-Hexanone	2.8	U	2.8	2.8	27.9	ug/Kg
124-48-1	Dibromochloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
106-93-4	1,2-Dibromoethane	0.56	U	0.56	0.56	5.6	ug/Kg
127-18-4	Tetrachloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
108-90-7	Chlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
100-41-4	Ethyl Benzene	0.56	U	0.56	0.56	5.6	ug/Kg
179601-23-1	m/p-Xylenes	1.1	U	0.8	1.1	11.2	ug/Kg
95-47-6	o-Xylene	0.56	U	0.56	0.56	5.6	ug/Kg
100-42-5	Styrene	0.56	U	0.5	0.56	5.6	ug/Kg
75-25-2	Bromoform	1.7	U	0.83	1.7	5.6	ug/Kg
98-82-8	Isopropylbenzene	0.56	U	0.54	0.56	5.6	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.56	U	0.51	0.56	5.6	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.56	U	0.41	0.56	5.6	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.56	U	0.46	0.56	5.6	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.6	U	0.97	5.6	5.6	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.1	U	0.56	1.1	5.6	ug/Kg
123-91-1	1,4-Dioxane	110	U	110	110	110	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	57.9		56 - 120		116%	SPK: 50
1868-53-7	Dibromofluoromethane	13.2	*	57 - 135		26%	SPK: 50
2037-26-5	Toluene-d8	44.5		67 - 123		89%	SPK: 50
460-00-4	4-Bromofluorobenzene	36.9		33 - 141		74%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	495481	4.77				
540-36-3	1,4-Difluorobenzene	846261	5.49				
3114-55-4	Chlorobenzene-d5	684631	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	224991	12.46				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0	SDG No.:	H5411
Lab Sample ID:	H5411-04	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	4.99 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051268.D	1		10/26/16 17:02	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-04RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051281.D	1		10/27/16 13:43	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.56	U	0.56	0.56	5.6	ug/Kg
74-87-3	Chloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-01-4	Vinyl Chloride	0.56	U	0.56	0.56	5.6	ug/Kg
74-83-9	Bromomethane	1.1	U	1.1	1.1	5.6	ug/Kg
75-00-3	Chloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-69-4	Trichlorofluoromethane	0.56	U	0.56	0.56	5.6	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.56	U	0.56	0.56	5.6	ug/Kg
75-35-4	1,1-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
67-64-1	Acetone	12.3	J	2.8	2.8	27.8	ug/Kg
75-15-0	Carbon Disulfide	1.1	J	0.56	0.56	5.6	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.56	U	0.56	0.56	5.6	ug/Kg
79-20-9	Methyl Acetate	1.1	U	1.1	1.1	5.6	ug/Kg
75-09-2	Methylene Chloride	4.7	J	0.56	0.56	5.6	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
75-34-3	1,1-Dichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
110-82-7	Cyclohexane	0.56	U	0.56	0.56	5.6	ug/Kg
78-93-3	2-Butanone	8.3	U	3.5	8.3	27.8	ug/Kg
56-23-5	Carbon Tetrachloride	0.56	U	0.56	0.56	5.6	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
74-97-5	Bromochloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
67-66-3	Chloroform	0.56	U	0.56	0.56	5.6	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
108-87-2	Methylcyclohexane	0.56	U	0.56	0.56	5.6	ug/Kg
71-43-2	Benzene	0.56	U	0.42	0.56	5.6	ug/Kg
107-06-2	1,2-Dichloroethane	0.56	U	0.56	0.56	5.6	ug/Kg
79-01-6	Trichloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
78-87-5	1,2-Dichloropropane	0.56	U	0.29	0.56	5.6	ug/Kg
75-27-4	Bromodichloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
108-10-1	4-Methyl-2-Pentanone	2.8	U	2.8	2.8	27.8	ug/Kg
108-88-3	Toluene	0.56	U	0.56	0.56	5.6	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.56	U	0.56	0.56	5.6	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.56	U	0.56	0.56	5.6	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-04RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051281.D	1		10/27/16 13:43	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.1	U	1	1.1	5.6	ug/Kg
591-78-6	2-Hexanone	2.8	U	2.8	2.8	27.8	ug/Kg
124-48-1	Dibromochloromethane	0.56	U	0.56	0.56	5.6	ug/Kg
106-93-4	1,2-Dibromoethane	0.56	U	0.56	0.56	5.6	ug/Kg
127-18-4	Tetrachloroethene	0.56	U	0.56	0.56	5.6	ug/Kg
108-90-7	Chlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
100-41-4	Ethyl Benzene	0.56	U	0.56	0.56	5.6	ug/Kg
179601-23-1	m/p-Xylenes	1.1	U	0.8	1.1	11.1	ug/Kg
95-47-6	o-Xylene	0.56	U	0.56	0.56	5.6	ug/Kg
100-42-5	Styrene	0.56	U	0.5	0.56	5.6	ug/Kg
75-25-2	Bromoform	1.7	U	0.82	1.7	5.6	ug/Kg
98-82-8	Isopropylbenzene	0.56	U	0.53	0.56	5.6	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.56	U	0.51	0.56	5.6	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.56	U	0.41	0.56	5.6	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.56	U	0.46	0.56	5.6	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.6	U	0.97	5.6	5.6	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.56	U	0.56	0.56	5.6	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.1	U	0.56	1.1	5.6	ug/Kg
123-91-1	1,4-Dioxane	110	U	110	110	110	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	41.6		56 - 120		83%	SPK: 50
1868-53-7	Dibromofluoromethane	7.4	*	57 - 135		15%	SPK: 50
2037-26-5	Toluene-d8	41.8		67 - 123		84%	SPK: 50
460-00-4	4-Bromofluorobenzene	32.6		33 - 141		65%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	681991	4.76				
540-36-3	1,4-Difluorobenzene	1017280	5.49				
3114-55-4	Chlorobenzene-d5	786396	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	265208	12.46				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-0-2.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-04RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	10.2
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051281.D	1		10/27/16 13:43	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Level (low/med):	low	% Solid:	85.9

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	7140		1	0.832	1.24	4.95	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-36-0	Antimony	1.02	J	1	0.555	0.619	2.48	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-38-2	Arsenic	13.3		1	0.248	0.248	0.991	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-39-3	Barium	181		1	0.396	1.24	4.95	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-41-7	Beryllium	0.33		1	0.059	0.074	0.297	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-43-9	Cadmium	1.67		1	0.059	0.074	0.297	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-70-2	Calcium	9900		1	1.06	24.8	99.1	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-47-3	Chromium	182		1	0.124	0.124	0.495	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-48-4	Cobalt	10.2		1	0.372	0.372	1.49	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-50-8	Copper	129		1	0.248	0.248	0.991	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7439-89-6	Iron	25900		1	1.24	1.24	4.95	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7439-92-1	Lead	388		1	0.119	0.248	0.594	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7439-95-4	Magnesium	2630		1	4.54	24.8	99.1	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7439-96-5	Manganese	215		1	0.188	0.248	0.991	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7439-97-6	Mercury	0.567		1	0.008	0.008	0.016	mg/Kg	10/27/16 15:55	10/28/16 14:01	SW7471A
7440-02-0	Nickel	64.8		1	0.456	0.495	1.98	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-09-7	Potassium	1140		1	3.47	24.8	99.1	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7782-49-2	Selenium	6.62		1	0.248	0.248	0.991	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-22-4	Silver	0.124	U	1	0.124	0.124	0.495	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-23-5	Sodium	425		1	2.5	24.8	99.1	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-28-0	Thallium	0.375	J	1	0.268	0.495	1.98	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-62-2	Vanadium	25.1		1	0.495	0.495	1.98	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010
7440-66-6	Zinc	472		1	0.495	0.495	1.98	mg/Kg	10/27/16 11:24	10/27/16 16:41	SW6010

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	14.1 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030741.D	1	10/27/16 11:26	10/27/16 19:36	PB94339

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
12674-11-2	Aroclor-1016	3.9	U	3.9	3.9	19.8	ug/kg
11104-28-2	Aroclor-1221	3.9	U	3.9	3.9	19.8	ug/kg
11141-16-5	Aroclor-1232	3.9	U	3.9	3.9	19.8	ug/kg
53469-21-9	Aroclor-1242	3.9	U	3.9	3.9	19.8	ug/kg
12672-29-6	Aroclor-1248	3.9	U	3.9	3.9	19.8	ug/kg
11097-69-1	Aroclor-1254	3.9	U	1.7	3.9	19.8	ug/kg
37324-23-5	Aroclor-1262	3.9	U	3.9	3.9	19.8	ug/kg
11100-14-4	Aroclor-1268	3.9	U	3.9	3.9	19.8	ug/kg
11096-82-5	Aroclor-1260	3.9	U	3.9	3.9	19.8	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	17.3		10 - 166		87%	SPK: 20
2051-24-3	Decachlorobiphenyl	13.9		60 - 125		70%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	14.1 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020989.D	1	10/27/16 11:23	10/27/16 18:33	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.384	U	0.151	0.384	2	ug/kg
319-85-7	beta-BHC	0.384	U	0.209	0.384	2	ug/kg
319-86-8	delta-BHC	0.384	U	0.116	0.384	2	ug/kg
58-89-9	gamma-BHC (Lindane)	0.384	U	0.174	0.384	2	ug/kg
76-44-8	Heptachlor	0.384	U	0.163	0.384	2	ug/kg
309-00-2	Aldrin	0.384	U	0.116	0.384	2	ug/kg
1024-57-3	Heptachlor epoxide	0.384	U	0.186	0.384	2	ug/kg
959-98-8	Endosulfan I	0.384	U	0.174	0.384	2	ug/kg
60-57-1	Dieldrin	0.384	U	0.151	0.384	2	ug/kg
72-55-9	4,4-DDE	0.384	U	0.232	0.384	2	ug/kg
72-20-8	Endrin	0.384	U	0.209	0.384	2	ug/kg
33213-65-9	Endosulfan II	0.384	U	0.163	0.384	2	ug/kg
72-54-8	4,4-DDD	0.384	U	0.198	0.384	2	ug/kg
1031-07-8	Endosulfan Sulfate	0.384	U	0.174	0.384	2	ug/kg
50-29-3	4,4-DDT	0.384	U	0.163	0.384	2	ug/kg
72-43-5	Methoxychlor	0.384	U	0.198	0.384	2	ug/kg
53494-70-5	Endrin ketone	0.384	U	0.151	0.384	2	ug/kg
7421-93-4	Endrin aldehyde	0.384	U	0.174	0.384	2	ug/kg
5103-71-9	alpha-Chlordane	0.384	U	0.163	0.384	2	ug/kg
5103-74-2	gamma-Chlordane	0.384	U	0.151	0.384	2	ug/kg
8001-35-2	Toxaphene	3.9	U	3.9	3.9	19.8	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	8.72		10 - 169		44%	SPK: 20
877-09-8	Tetrachloro-m-xylene	9.65		31 - 151		48%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	14.1 Decanted:
Sample Wt/Vol:	30.04 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020989.D	1	10/27/16 11:23	10/27/16 18:33	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090884.D	1	10/27/16 12:27	10/27/16 23:19	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	38.7	U	20.2	38.7	380	ug/Kg
108-95-2	Phenol	38.7	U	8.9	38.7	380	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	38.7	U	18.6	38.7	380	ug/Kg
95-57-8	2-Chlorophenol	38.7	U	20.4	38.7	380	ug/Kg
95-48-7	2-Methylphenol	38.7	U	21	38.7	380	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	38.7	U	16	38.7	380	ug/Kg
98-86-2	Acetophenone	38.7	U	11.8	38.7	380	ug/Kg
65794-96-9	3+4-Methylphenols	38.7	U	20.1	38.7	380	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	38.7	U	19.5	38.7	380	ug/Kg
67-72-1	Hexachloroethane	38.7	U	17.3	38.7	380	ug/Kg
98-95-3	Nitrobenzene	38.7	U	14.6	38.7	380	ug/Kg
78-59-1	Isophorone	38.7	U	12.8	38.7	380	ug/Kg
88-75-5	2-Nitrophenol	38.7	U	18.7	38.7	380	ug/Kg
105-67-9	2,4-Dimethylphenol	38.7	U	21.9	38.7	380	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	38.7	U	22.3	38.7	380	ug/Kg
120-83-2	2,4-Dichlorophenol	38.7	U	14.7	38.7	380	ug/Kg
91-20-3	Naphthalene	280	J	13.3	38.7	380	ug/Kg
106-47-8	4-Chloroaniline	38.7	U	27.3	38.7	380	ug/Kg
87-68-3	Hexachlorobutadiene	38.7	U	14	38.7	380	ug/Kg
105-60-2	Caprolactam	77.3	U	18	77.3	380	ug/Kg
59-50-7	4-Chloro-3-methylphenol	38.7	U	17.2	38.7	380	ug/Kg
91-57-6	2-Methylnaphthalene	140	J	9.7	38.7	380	ug/Kg
77-47-4	Hexachlorocyclopentadiene	38.7	U	9.4	38.7	380	ug/Kg
88-06-2	2,4,6-Trichlorophenol	38.7	U	11.8	38.7	380	ug/Kg
95-95-4	2,4,5-Trichlorophenol	38.7	U	27.1	38.7	380	ug/Kg
92-52-4	1,1-Biphenyl	38.7	U	14.6	38.7	380	ug/Kg
91-58-7	2-Chloronaphthalene	38.7	U	8.8	38.7	380	ug/Kg
88-74-4	2-Nitroaniline	38.7	U	17.2	38.7	380	ug/Kg
131-11-3	Dimethylphthalate	980		10.4	38.7	380	ug/Kg
208-96-8	Acenaphthylene	77.7	J	9.7	38.7	380	ug/Kg
606-20-2	2,6-Dinitrotoluene	38.7	U	15.8	38.7	380	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090884.D	1	10/27/16 12:27	10/27/16 23:19	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	77.3	U	24.8	77.3	380	ug/Kg
83-32-9	Acenaphthene	290	J	10.9	38.7	380	ug/Kg
51-28-5	2,4-Dinitrophenol	310	U	39.3	310	380	ug/Kg
100-02-7	4-Nitrophenol	190	U	71.8	190	380	ug/Kg
132-64-9	Dibenzofuran	220	J	15.1	38.7	380	ug/Kg
121-14-2	2,4-Dinitrotoluene	38.7	U	11.6	38.7	380	ug/Kg
84-66-2	Diethylphthalate	38.7	U	6	38.7	380	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	38.7	U	21	38.7	380	ug/Kg
86-73-7	Fluorene	260	J	14.6	38.7	380	ug/Kg
100-01-6	4-Nitroaniline	77.3	U	50.3	77.3	380	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	190	U	22.2	190	380	ug/Kg
86-30-6	n-Nitrosodiphenylamine	38.7	U	9.3	38.7	380	ug/Kg
101-55-3	4-Bromophenyl-phenylether	38.7	U	7.5	38.7	380	ug/Kg
118-74-1	Hexachlorobenzene	38.7	U	15.8	38.7	380	ug/Kg
1912-24-9	Atrazine	38.7	U	20.4	38.7	380	ug/Kg
87-86-5	Pentachlorophenol	38.7	U	26.4	38.7	380	ug/Kg
85-01-8	Phenanthrene	2400		10.4	38.7	380	ug/Kg
120-12-7	Anthracene	520		7.9	38.7	380	ug/Kg
86-74-8	Carbazole	170	J	8.5	38.7	380	ug/Kg
84-74-2	Di-n-butylphthalate	38.7	U	30.4	38.7	380	ug/Kg
206-44-0	Fluoranthene	2300		7.8	38.7	380	ug/Kg
129-00-0	Pyrene	2500		9.3	38.7	380	ug/Kg
85-68-7	Butylbenzylphthalate	38.7	U	18.6	38.7	380	ug/Kg
91-94-1	3,3-Dichlorobenzidine	38.7	U	24.8	38.7	380	ug/Kg
56-55-3	Benzo(a)anthracene	1400		18.4	38.7	380	ug/Kg
218-01-9	Chrysene	1400		17.5	38.7	380	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	38.7	U	13.7	38.7	380	ug/Kg
117-84-0	Di-n-octyl phthalate	38.7	U	4.4	38.7	380	ug/Kg
205-99-2	Benzo(b)fluoranthene	1500		12.6	38.7	380	ug/Kg
207-08-9	Benzo(k)fluoranthene	540		18.2	38.7	380	ug/Kg
50-32-8	Benzo(a)pyrene	1300		8.4	38.7	380	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	600		12.9	38.7	380	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	160	J	11.1	38.7	380	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090884.D	1	10/27/16 12:27	10/27/16 23:19	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	680		15.7	38.7	380	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	38.7	U	15.2	38.7	380	ug/Kg
123-91-1	1,4-Dioxane	77.3	U	15.2	77.3	380	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	38.7	U	15.2	38.7	380	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	110		28 - 127		71%	SPK: 150
13127-88-3	Phenol-d6	99.7		34 - 127		66%	SPK: 150
4165-60-0	Nitrobenzene-d5	71.4		31 - 132		71%	SPK: 100
321-60-8	2-Fluorobiphenyl	63.6		39 - 123		64%	SPK: 100
118-79-6	2,4,6-Tribromophenol	89.2		30 - 133		59%	SPK: 150
1718-51-0	Terphenyl-d14	51.6		37 - 115		52%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	143112	6.77				
1146-65-2	Naphthalene-d8	595110	8.06				
15067-26-2	Acenaphthene-d10	298598	9.81				
1517-22-2	Phenanthrene-d10	424755	11.3				
1719-03-5	Chrysene-d12	370742	13.94				
1520-96-3	Perylene-d12	324732	15.35				
TENTATIVE IDENTIFIED COMPOUNDS							
000123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	600	A			4.93	ug/Kg
	unknown6.53	2900	J			6.53	ug/Kg
017861-18-6	Phenol, 3-(2-phenylethenyl)-, (E)-	160	J			11.06	ug/Kg
035599-77-0	Tridecane, 1-iodo-	230	J			11.17	ug/Kg
002531-84-2	Phenanthrene, 2-methyl-	270	J			11.8	ug/Kg
000610-48-0	Anthracene, 1-methyl-	160	J			11.87	ug/Kg
000203-64-5	4H-Cyclopenta[def]phenanthrene	790	J			11.9	ug/Kg
	unknown11.98	150	J			11.98	ug/Kg
035465-71-5	2-Phenylnaphthalene	550	J			12.09	ug/Kg
1000197-14-1	4b,8-Dimethyl-2-isopropylphenanthr	270	J			12.25	ug/Kg
003674-66-6	Phenanthrene, 2,5-dimethyl-	250	J			12.35	ug/Kg
002789-88-0	di-p-Tolylacetylene	870	J			12.41	ug/Kg
000483-65-8	Phenanthrene, 1-methyl-7-(1-methyl	590	J			13.03	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090884.D	1	10/27/16 12:27	10/27/16 23:19	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
	unknown13.16	210	J			13.16	ug/Kg
	unknown13.68	170	J			13.68	ug/Kg
	unknown16.00	180	J			16	ug/Kg
	unknown16.40	270	J			16.4	ug/Kg

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090946.D	1	10/27/16 12:27	10/31/16 23:27	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	38.7	U	20.2	38.7	380	ug/Kg
108-95-2	Phenol	38.7	U	8.9	38.7	380	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	38.7	U	18.6	38.7	380	ug/Kg
95-57-8	2-Chlorophenol	38.7	U	20.4	38.7	380	ug/Kg
95-48-7	2-Methylphenol	38.7	U	21	38.7	380	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	38.7	U	16	38.7	380	ug/Kg
98-86-2	Acetophenone	38.7	U	11.8	38.7	380	ug/Kg
65794-96-9	3+4-Methylphenols	38.7	U	20.1	38.7	380	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	38.7	U	19.5	38.7	380	ug/Kg
67-72-1	Hexachloroethane	38.7	U	17.3	38.7	380	ug/Kg
98-95-3	Nitrobenzene	38.7	U	14.6	38.7	380	ug/Kg
78-59-1	Isophorone	38.7	U	12.8	38.7	380	ug/Kg
88-75-5	2-Nitrophenol	38.7	U	18.7	38.7	380	ug/Kg
105-67-9	2,4-Dimethylphenol	38.7	U	21.9	38.7	380	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	38.7	U	22.3	38.7	380	ug/Kg
120-83-2	2,4-Dichlorophenol	38.7	U	14.7	38.7	380	ug/Kg
91-20-3	Naphthalene	300	J	13.3	38.7	380	ug/Kg
106-47-8	4-Chloroaniline	38.7	U	27.3	38.7	380	ug/Kg
87-68-3	Hexachlorobutadiene	38.7	U	14	38.7	380	ug/Kg
105-60-2	Caprolactam	77.3	U	18	77.3	380	ug/Kg
59-50-7	4-Chloro-3-methylphenol	38.7	U	17.2	38.7	380	ug/Kg
91-57-6	2-Methylnaphthalene	140	J	9.7	38.7	380	ug/Kg
77-47-4	Hexachlorocyclopentadiene	38.7	U	9.4	38.7	380	ug/Kg
88-06-2	2,4,6-Trichlorophenol	38.7	U	11.8	38.7	380	ug/Kg
95-95-4	2,4,5-Trichlorophenol	38.7	U	27.1	38.7	380	ug/Kg
92-52-4	1,1-Biphenyl	38.7	U	14.6	38.7	380	ug/Kg
91-58-7	2-Chloronaphthalene	38.7	U	8.8	38.7	380	ug/Kg
88-74-4	2-Nitroaniline	38.7	U	17.2	38.7	380	ug/Kg
131-11-3	Dimethylphthalate	830		10.4	38.7	380	ug/Kg
208-96-8	Acenaphthylene	95.5	J	9.7	38.7	380	ug/Kg
606-20-2	2,6-Dinitrotoluene	38.7	U	15.8	38.7	380	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090946.D	1	10/27/16 12:27	10/31/16 23:27	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	77.3	U	24.8	77.3	380	ug/Kg
83-32-9	Acenaphthene	340	J	10.9	38.7	380	ug/Kg
51-28-5	2,4-Dinitrophenol	310	U	39.3	310	380	ug/Kg
100-02-7	4-Nitrophenol	190	U	71.8	190	380	ug/Kg
132-64-9	Dibenzofuran	210	J	15.1	38.7	380	ug/Kg
121-14-2	2,4-Dinitrotoluene	38.7	U	11.6	38.7	380	ug/Kg
84-66-2	Diethylphthalate	38.7	U	6	38.7	380	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	38.7	U	21	38.7	380	ug/Kg
86-73-7	Fluorene	290	J	14.6	38.7	380	ug/Kg
100-01-6	4-Nitroaniline	77.3	U	50.3	77.3	380	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	190	U	22.2	190	380	ug/Kg
86-30-6	n-Nitrosodiphenylamine	38.7	U	9.3	38.7	380	ug/Kg
101-55-3	4-Bromophenyl-phenylether	38.7	U	7.5	38.7	380	ug/Kg
118-74-1	Hexachlorobenzene	38.7	U	15.8	38.7	380	ug/Kg
1912-24-9	Atrazine	38.7	U	20.4	38.7	380	ug/Kg
87-86-5	Pentachlorophenol	38.7	U	26.4	38.7	380	ug/Kg
85-01-8	Phenanthrene	2800		10.4	38.7	380	ug/Kg
120-12-7	Anthracene	540		7.9	38.7	380	ug/Kg
86-74-8	Carbazole	170	J	8.5	38.7	380	ug/Kg
84-74-2	Di-n-butylphthalate	38.7	U	30.4	38.7	380	ug/Kg
206-44-0	Fluoranthene	2800		7.8	38.7	380	ug/Kg
129-00-0	Pyrene	2300		9.3	38.7	380	ug/Kg
85-68-7	Butylbenzylphthalate	38.7	U	18.6	38.7	380	ug/Kg
91-94-1	3,3-Dichlorobenzidine	38.7	U	24.8	38.7	380	ug/Kg
56-55-3	Benzo(a)anthracene	1700		18.4	38.7	380	ug/Kg
218-01-9	Chrysene	1300		17.5	38.7	380	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	38.7	U	13.7	38.7	380	ug/Kg
117-84-0	Di-n-octyl phthalate	38.7	U	4.4	38.7	380	ug/Kg
205-99-2	Benzo(b)fluoranthene	1600		12.6	38.7	380	ug/Kg
207-08-9	Benzo(k)fluoranthene	410		18.2	38.7	380	ug/Kg
50-32-8	Benzo(a)pyrene	1200		8.4	38.7	380	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	620		12.9	38.7	380	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	230	J	11.1	38.7	380	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	14.1
Sample Wt/Vol:	30.11 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090946.D	1	10/27/16 12:27	10/31/16 23:27	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	770		15.7	38.7	380	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	38.7	U	15.2	38.7	380	ug/Kg
123-91-1	1,4-Dioxane	77.3	U	15.2	77.3	380	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	38.7	U	15.2	38.7	380	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	100		28 - 127		69%	SPK: 150
13127-88-3	Phenol-d6	120		34 - 127		77%	SPK: 150
4165-60-0	Nitrobenzene-d5	95.1		31 - 132		95%	SPK: 100
321-60-8	2-Fluorobiphenyl	59.7		39 - 123		60%	SPK: 100
118-79-6	2,4,6-Tribromophenol	100		30 - 133		68%	SPK: 150
1718-51-0	Terphenyl-d14	48.9		37 - 115		49%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	143042	6.75				
1146-65-2	Naphthalene-d8	447291	8.03				
15067-26-2	Acenaphthene-d10	276812	9.79				
1517-22-2	Phenanthrene-d10	350700	11.26				
1719-03-5	Chrysene-d12	359996	13.91				
1520-96-3	Perylene-d12	286501	15.31				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051269.D	1		10/26/16 17:31	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.58	U	0.58	0.58	5.8	ug/Kg
74-87-3	Chloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-01-4	Vinyl Chloride	0.58	U	0.58	0.58	5.8	ug/Kg
74-83-9	Bromomethane	1.2	U	1.2	1.2	5.8	ug/Kg
75-00-3	Chloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-69-4	Trichlorofluoromethane	0.58	U	0.58	0.58	5.8	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-35-4	1,1-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
67-64-1	Acetone	2.9	U	2.9	2.9	29.1	ug/Kg
75-15-0	Carbon Disulfide	0.58	U	0.58	0.58	5.8	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.58	U	0.58	0.58	5.8	ug/Kg
79-20-9	Methyl Acetate	1.2	U	1.2	1.2	5.8	ug/Kg
75-09-2	Methylene Chloride	6.6		0.58	0.58	5.8	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
75-34-3	1,1-Dichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
110-82-7	Cyclohexane	0.58	U	0.58	0.58	5.8	ug/Kg
78-93-3	2-Butanone	8.7	U	3.6	8.7	29.1	ug/Kg
56-23-5	Carbon Tetrachloride	0.58	U	0.58	0.58	5.8	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
74-97-5	Bromochloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
67-66-3	Chloroform	0.58	U	0.58	0.58	5.8	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
108-87-2	Methylcyclohexane	0.58	U	0.58	0.58	5.8	ug/Kg
71-43-2	Benzene	0.58	U	0.44	0.58	5.8	ug/Kg
107-06-2	1,2-Dichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
79-01-6	Trichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
78-87-5	1,2-Dichloropropane	0.58	U	0.3	0.58	5.8	ug/Kg
75-27-4	Bromodichloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
108-10-1	4-Methyl-2-Pentanone	2.9	U	2.9	2.9	29.1	ug/Kg
108-88-3	Toluene	0.58	U	0.58	0.58	5.8	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.58	U	0.58	0.58	5.8	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.58	U	0.58	0.58	5.8	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051269.D	1		10/26/16 17:31	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.2	U	1	1.2	5.8	ug/Kg
591-78-6	2-Hexanone	2.9	U	2.9	2.9	29.1	ug/Kg
124-48-1	Dibromochloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
106-93-4	1,2-Dibromoethane	0.58	U	0.58	0.58	5.8	ug/Kg
127-18-4	Tetrachloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
108-90-7	Chlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
100-41-4	Ethyl Benzene	0.58	U	0.58	0.58	5.8	ug/Kg
179601-23-1	m/p-Xylenes	1.2	U	0.84	1.2	11.6	ug/Kg
95-47-6	o-Xylene	0.58	U	0.58	0.58	5.8	ug/Kg
100-42-5	Styrene	0.58	U	0.52	0.58	5.8	ug/Kg
75-25-2	Bromoform	1.7	U	0.86	1.7	5.8	ug/Kg
98-82-8	Isopropylbenzene	0.58	U	0.56	0.58	5.8	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.58	U	0.54	0.58	5.8	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.58	U	0.43	0.58	5.8	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.58	U	0.48	0.58	5.8	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.8	U	1	5.8	5.8	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.58	1.2	5.8	ug/Kg
123-91-1	1,4-Dioxane	120	U	120	120	120	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	45.6		56 - 120		91%	SPK: 50
1868-53-7	Dibromofluoromethane	50.5		57 - 135		101%	SPK: 50
2037-26-5	Toluene-d8	42.4		67 - 123		85%	SPK: 50
460-00-4	4-Bromofluorobenzene	22		33 - 141		44%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	410779	4.76				
540-36-3	1,4-Difluorobenzene	603518	5.49				
3114-55-4	Chlorobenzene-d5	395044	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	87008	12.46				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0	SDG No.:	H5411
Lab Sample ID:	H5411-05	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051269.D	1		10/26/16 17:31	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051282.D	1		10/27/16 14:11	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.58	U	0.58	0.58	5.8	ug/Kg
74-87-3	Chloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-01-4	Vinyl Chloride	0.58	U	0.58	0.58	5.8	ug/Kg
74-83-9	Bromomethane	1.2	U	1.2	1.2	5.8	ug/Kg
75-00-3	Chloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-69-4	Trichlorofluoromethane	0.58	U	0.58	0.58	5.8	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.58	U	0.58	0.58	5.8	ug/Kg
75-35-4	1,1-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
67-64-1	Acetone	2.9	U	2.9	2.9	29	ug/Kg
75-15-0	Carbon Disulfide	0.58	U	0.58	0.58	5.8	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.58	U	0.58	0.58	5.8	ug/Kg
79-20-9	Methyl Acetate	1.2	U	1.2	1.2	5.8	ug/Kg
75-09-2	Methylene Chloride	4.9	J	0.58	0.58	5.8	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
75-34-3	1,1-Dichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
110-82-7	Cyclohexane	0.58	U	0.58	0.58	5.8	ug/Kg
78-93-3	2-Butanone	8.7	U	3.6	8.7	29	ug/Kg
56-23-5	Carbon Tetrachloride	0.58	U	0.58	0.58	5.8	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
74-97-5	Bromochloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
67-66-3	Chloroform	0.58	U	0.58	0.58	5.8	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
108-87-2	Methylcyclohexane	0.58	U	0.58	0.58	5.8	ug/Kg
71-43-2	Benzene	0.58	U	0.44	0.58	5.8	ug/Kg
107-06-2	1,2-Dichloroethane	0.58	U	0.58	0.58	5.8	ug/Kg
79-01-6	Trichloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
78-87-5	1,2-Dichloropropane	0.58	U	0.3	0.58	5.8	ug/Kg
75-27-4	Bromodichloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
108-10-1	4-Methyl-2-Pentanone	2.9	U	2.9	2.9	29	ug/Kg
108-88-3	Toluene	0.58	U	0.58	0.58	5.8	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.58	U	0.58	0.58	5.8	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.58	U	0.58	0.58	5.8	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051282.D	1		10/27/16 14:11	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.2	U	1	1.2	5.8	ug/Kg
591-78-6	2-Hexanone	2.9	U	2.9	2.9	29	ug/Kg
124-48-1	Dibromochloromethane	0.58	U	0.58	0.58	5.8	ug/Kg
106-93-4	1,2-Dibromoethane	0.58	U	0.58	0.58	5.8	ug/Kg
127-18-4	Tetrachloroethene	0.58	U	0.58	0.58	5.8	ug/Kg
108-90-7	Chlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
100-41-4	Ethyl Benzene	0.58	U	0.58	0.58	5.8	ug/Kg
179601-23-1	m/p-Xylenes	1.2	U	0.84	1.2	11.6	ug/Kg
95-47-6	o-Xylene	0.58	U	0.58	0.58	5.8	ug/Kg
100-42-5	Styrene	0.58	U	0.52	0.58	5.8	ug/Kg
75-25-2	Bromoform	1.7	U	0.86	1.7	5.8	ug/Kg
98-82-8	Isopropylbenzene	0.58	U	0.56	0.58	5.8	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.58	U	0.53	0.58	5.8	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.58	U	0.43	0.58	5.8	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.58	U	0.48	0.58	5.8	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	5.8	U	1	5.8	5.8	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.58	U	0.58	0.58	5.8	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.58	1.2	5.8	ug/Kg
123-91-1	1,4-Dioxane	120	U	120	120	120	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	41.9		56 - 120		84%	SPK: 50
1868-53-7	Dibromofluoromethane	46.8		57 - 135		94%	SPK: 50
2037-26-5	Toluene-d8	41.2		67 - 123		82%	SPK: 50
460-00-4	4-Bromofluorobenzene	20.8		33 - 141		42%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	559231	4.77				
540-36-3	1,4-Difluorobenzene	815663	5.5				
3114-55-4	Chlorobenzene-d5	515519	9.66				
3855-82-1	1,4-Dichlorobenzene-d4	97040	12.47				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-8.5-9.0RE	SDG No.:	H5411
Lab Sample ID:	H5411-05RE	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	14.1
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051282.D	1		10/27/16 14:11	VF102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16 09:00
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-06	Matrix:	SOIL
		% Solid:	65.6

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Corrosivity	8.7		1	0	0	0	pH		10/26/16 16:33	9045C
Ignitability	NO		1	0	0	0	oC		10/28/16 12:22	
Reactive Cyanide	0.05	U	1	0.05	0.05	0.05	mg/Kg	10/28/16 11:19	10/28/16 15:08	9012B
Reactive Sulfide	10	U	1	10	10	10	mg/Kg	10/29/16 10:20	10/29/16 13:20	9034

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-06	Matrix:	SOIL
Analytical Method:	8015B DRO	% Moisture:	34.4 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	1 mL
Soil Aliquot Vol:	uL	Test:	Diesel Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
FC024442.D	1	10/27/16 08:00	10/31/16 14:21	PB94336

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
DRO	DRO	42997		1270	1270	2530	ug/kg
SURROGATES							
16416-32-3	Tetracosane-d50	24		37 - 130		120%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-06	Matrix:	SOIL
Analytical Method:	8015B GRO	% Moisture:	34.4 Decanted:
Sample Wt/Vol:	5.01 Units: g	Final Vol:	5 mL
Soil Aliquot Vol:	uL	Test:	Gasoline Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Date Analyzed	Prep Batch ID
FB007692.D	1	11/01/16 13:55	FB110116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
GRO	GRO	34	U	18	34	68	ug/kg
SURROGATES							
98-08-8	Alpha,Alpha,Alpha-Trifluoroto	9.07	*	50 - 150		45%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-06RE	Matrix:	SOIL
Analytical Method:	8015B GRO	% Moisture:	34.4 Decanted:
Sample Wt/Vol:	5.03 Units: g	Final Vol:	5 mL
Soil Aliquot Vol:	uL	Test:	Gasoline Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Date Analyzed	Prep Batch ID
FB007695.D	1	11/01/16 15:44	FB110116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
GRO	GRO	34	U	18	34	68	ug/kg
SURROGATES							
98-08-8	Alpha,Alpha,Alpha-Trifluoroto	8.28	*	50 - 150		41%	SPK: 20

Comments:

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LOQ = Limit of Quantitation
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Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-02-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-06	Matrix:	TCLP
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	96.5	J	1	25	25.0	100	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7440-39-3	Barium	1140		1	40	125	500	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7440-43-9	Cadmium	7.5	U	1	5	7.5	30	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7440-47-3	Chromium	12.5	U	1	11	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7439-92-1	Lead	86.1		1	15	15.0	60	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7439-97-6	Mercury	1	U	1	1	1.0	2	ug/L	10/28/16 12:53	10/28/16 17:25	SW7470A
7782-49-2	Selenium	50	U	1	48	50.0	100	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010
7440-22-4	Silver	12.5	U	1	12.5	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:55	SW6010

Color Before:	Colorless	Clarity Before:		Texture:	Clear
Color After:	Colorless	Clarity After:		Artifacts:	Clear
Comments:	TCLP METALS				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Level (low/med):	low	% Solid:	82.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	8300		1	0.872	1.3	5.19	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-36-0	Antimony	0.649	U	1	0.582	0.649	2.6	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-38-2	Arsenic	4.53		1	0.26	0.26	1.04	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-39-3	Barium	83.5		1	0.415	1.3	5.19	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-41-7	Beryllium	0.351		1	0.062	0.078	0.312	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-43-9	Cadmium	0.078	U	1	0.062	0.078	0.312	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-70-2	Calcium	32800		1	1.11	26	104	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-47-3	Chromium	19.7		1	0.13	0.13	0.519	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-48-4	Cobalt	7.36		1	0.389	0.389	1.56	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-50-8	Copper	35.4		1	0.26	0.26	1.04	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7439-89-6	Iron	15900		1	1.3	1.3	5.19	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7439-92-1	Lead	83.1		1	0.125	0.26	0.623	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7439-95-4	Magnesium	5840		1	4.76	26	104	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7439-96-5	Manganese	219		1	0.197	0.26	1.04	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7439-97-6	Mercury	0.237		1	0.008	0.008	0.016	mg/Kg	10/27/16 15:55	10/28/16 14:03	SW7471A
7440-02-0	Nickel	22		1	0.478	0.519	2.08	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-09-7	Potassium	1220		1	3.63	26	104	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7782-49-2	Selenium	0.857	J	1	0.26	0.26	1.04	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-22-4	Silver	0.13	U	1	0.13	0.13	0.519	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-23-5	Sodium	348		1	2.62	26	104	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-28-0	Thallium	0.519	U	1	0.28	0.519	2.08	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-62-2	Vanadium	41.3		1	0.519	0.519	2.08	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010
7440-66-6	Zinc	107		1	0.519	0.519	2.08	mg/Kg	10/27/16 11:24	10/27/16 16:45	SW6010

Color Before:	Brown	Clarity Before:		Texture:	Medium
Color After:	Yellow	Clarity After:		Artifacts:	No
Comments:	METALS-TAL				

U = Not Detected
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MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8082A	% Moisture:	17.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030742.D	1	10/27/16 11:26	10/27/16 19:52	PB94339

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
12674-11-2	Aroclor-1016	4	U	4	4	20.6	ug/kg
11104-28-2	Aroclor-1221	4	U	4	4	20.6	ug/kg
11141-16-5	Aroclor-1232	4	U	4	4	20.6	ug/kg
53469-21-9	Aroclor-1242	4	U	4	4	20.6	ug/kg
12672-29-6	Aroclor-1248	4	U	4	4	20.6	ug/kg
11097-69-1	Aroclor-1254	4	U	1.8	4	20.6	ug/kg
37324-23-5	Aroclor-1262	4	U	4	4	20.6	ug/kg
11100-14-4	Aroclor-1268	4	U	4	4	20.6	ug/kg
11096-82-5	Aroclor-1260	4	U	4	4	20.6	ug/kg
SURROGATES							
877-09-8	Tetrachloro-m-xylene	25		10 - 166		125%	SPK: 20
2051-24-3	Decachlorobiphenyl	16.2		60 - 125		81%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	17.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020988.D	1	10/27/16 11:23	10/27/16 18:19	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
319-84-6	alpha-BHC	0.4	U	0.157	0.4	2.1	ug/kg
319-85-7	beta-BHC	0.4	U	0.218	0.4	2.1	ug/kg
319-86-8	delta-BHC	0.4	U	0.121	0.4	2.1	ug/kg
58-89-9	gamma-BHC (Lindane)	0.4	U	0.182	0.4	2.1	ug/kg
76-44-8	Heptachlor	0.4	U	0.17	0.4	2.1	ug/kg
309-00-2	Aldrin	0.4	U	0.121	0.4	2.1	ug/kg
1024-57-3	Heptachlor epoxide	0.4	U	0.194	0.4	2.1	ug/kg
959-98-8	Endosulfan I	0.4	U	0.182	0.4	2.1	ug/kg
60-57-1	Dieldrin	0.4	U	0.157	0.4	2.1	ug/kg
72-55-9	4,4-DDE	21.4		0.242	0.4	2.1	ug/kg
72-20-8	Endrin	0.4	U	0.218	0.4	2.1	ug/kg
33213-65-9	Endosulfan II	0.4	U	0.17	0.4	2.1	ug/kg
72-54-8	4,4-DDD	0.4	U	0.206	0.4	2.1	ug/kg
1031-07-8	Endosulfan Sulfate	0.4	U	0.182	0.4	2.1	ug/kg
50-29-3	4,4-DDT	0.4	U	0.17	0.4	2.1	ug/kg
72-43-5	Methoxychlor	0.4	U	0.206	0.4	2.1	ug/kg
53494-70-5	Endrin ketone	0.4	U	0.157	0.4	2.1	ug/kg
7421-93-4	Endrin aldehyde	0.4	U	0.182	0.4	2.1	ug/kg
5103-71-9	alpha-Chlordane	6.7		0.17	0.4	2.1	ug/kg
5103-74-2	gamma-Chlordane	0.4	U	0.157	0.4	2.1	ug/kg
8001-35-2	Toxaphene	4	U	4	4	20.6	ug/kg
SURROGATES							
2051-24-3	Decachlorobiphenyl	10.1		10 - 169		50%	SPK: 20
877-09-8	Tetrachloro-m-xylene	10.9		31 - 151		54%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8081	% Moisture:	17.7 Decanted:
Sample Wt/Vol:	30.1 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL020988.D	1	10/27/16 11:23	10/27/16 18:19	PB94341

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	17.7
Sample Wt/Vol:	30.04 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090905.D	10	10/27/16 12:27	10/28/16 13:00	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
100-52-7	Benzaldehyde	400	U	210	400	4000	ug/Kg
108-95-2	Phenol	400	U	93.4	400	4000	ug/Kg
111-44-4	bis(2-Chloroethyl)ether	400	U	190	400	4000	ug/Kg
95-57-8	2-Chlorophenol	400	U	210	400	4000	ug/Kg
95-48-7	2-Methylphenol	400	U	220	400	4000	ug/Kg
108-60-1	2,2-oxybis(1-Chloropropane)	400	U	170	400	4000	ug/Kg
98-86-2	Acetophenone	400	U	120	400	4000	ug/Kg
65794-96-9	3+4-Methylphenols	400	U	210	400	4000	ug/Kg
621-64-7	n-Nitroso-di-n-propylamine	400	U	200	400	4000	ug/Kg
67-72-1	Hexachloroethane	400	U	180	400	4000	ug/Kg
98-95-3	Nitrobenzene	400	U	150	400	4000	ug/Kg
78-59-1	Isophorone	400	U	130	400	4000	ug/Kg
88-75-5	2-Nitrophenol	400	U	200	400	4000	ug/Kg
105-67-9	2,4-Dimethylphenol	400	U	230	400	4000	ug/Kg
111-91-1	bis(2-Chloroethoxy)methane	400	U	230	400	4000	ug/Kg
120-83-2	2,4-Dichlorophenol	400	U	150	400	4000	ug/Kg
91-20-3	Naphthalene	400	U	140	400	4000	ug/Kg
106-47-8	4-Chloroaniline	400	U	290	400	4000	ug/Kg
87-68-3	Hexachlorobutadiene	400	U	150	400	4000	ug/Kg
105-60-2	Caprolactam	810	U	190	810	4000	ug/Kg
59-50-7	4-Chloro-3-methylphenol	400	U	180	400	4000	ug/Kg
91-57-6	2-Methylnaphthalene	400	U	100	400	4000	ug/Kg
77-47-4	Hexachlorocyclopentadiene	400	U	98.3	400	4000	ug/Kg
88-06-2	2,4,6-Trichlorophenol	400	U	120	400	4000	ug/Kg
95-95-4	2,4,5-Trichlorophenol	400	U	280	400	4000	ug/Kg
92-52-4	1,1-Biphenyl	400	U	150	400	4000	ug/Kg
91-58-7	2-Chloronaphthalene	400	U	92.2	400	4000	ug/Kg
88-74-4	2-Nitroaniline	400	U	180	400	4000	ug/Kg
131-11-3	Dimethylphthalate	400	U	110	400	4000	ug/Kg
208-96-8	Acenaphthylene	400	U	100	400	4000	ug/Kg
606-20-2	2,6-Dinitrotoluene	400	U	170	400	4000	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	17.7
Sample Wt/Vol:	30.04 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090905.D	10	10/27/16 12:27	10/28/16 13:00	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
99-09-2	3-Nitroaniline	810	U	260	810	4000	ug/Kg
83-32-9	Acenaphthene	400	U	110	400	4000	ug/Kg
51-28-5	2,4-Dinitrophenol	3200	U	410	3200	4000	ug/Kg
100-02-7	4-Nitrophenol	2000	U	750	2000	4000	ug/Kg
132-64-9	Dibenzofuran	400	U	160	400	4000	ug/Kg
121-14-2	2,4-Dinitrotoluene	400	U	120	400	4000	ug/Kg
84-66-2	Diethylphthalate	400	U	63.1	400	4000	ug/Kg
7005-72-3	4-Chlorophenyl-phenylether	400	U	220	400	4000	ug/Kg
86-73-7	Fluorene	400	U	150	400	4000	ug/Kg
100-01-6	4-Nitroaniline	810	U	530	810	4000	ug/Kg
534-52-1	4,6-Dinitro-2-methylphenol	2000	U	230	2000	4000	ug/Kg
86-30-6	n-Nitrosodiphenylamine	400	U	97.1	400	4000	ug/Kg
101-55-3	4-Bromophenyl-phenylether	400	U	78.9	400	4000	ug/Kg
118-74-1	Hexachlorobenzene	400	U	170	400	4000	ug/Kg
1912-24-9	Atrazine	400	U	210	400	4000	ug/Kg
87-86-5	Pentachlorophenol	400	U	280	400	4000	ug/Kg
85-01-8	Phenanthrene	1400	J	110	400	4000	ug/Kg
120-12-7	Anthracene	400	U	82.5	400	4000	ug/Kg
86-74-8	Carbazole	400	U	88.6	400	4000	ug/Kg
84-74-2	Di-n-butylphthalate	400	U	320	400	4000	ug/Kg
206-44-0	Fluoranthene	1200	J	81.3	400	4000	ug/Kg
129-00-0	Pyrene	1200	J	97.1	400	4000	ug/Kg
85-68-7	Butylbenzylphthalate	400	U	190	400	4000	ug/Kg
91-94-1	3,3-Dichlorobenzidine	400	U	260	400	4000	ug/Kg
56-55-3	Benzo(a)anthracene	400	U	190	400	4000	ug/Kg
218-01-9	Chrysene	400	U	180	400	4000	ug/Kg
117-81-7	Bis(2-ethylhexyl)phthalate	400	U	140	400	4000	ug/Kg
117-84-0	Di-n-octyl phthalate	400	U	46.1	400	4000	ug/Kg
205-99-2	Benzo(b)fluoranthene	400	U	130	400	4000	ug/Kg
207-08-9	Benzo(k)fluoranthene	400	U	190	400	4000	ug/Kg
50-32-8	Benzo(a)pyrene	400	U	87.4	400	4000	ug/Kg
193-39-5	Indeno(1,2,3-cd)pyrene	400	U	130	400	4000	ug/Kg
53-70-3	Dibenzo(a,h)anthracene	400	U	120	400	4000	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8270	% Moisture:	17.7
Sample Wt/Vol:	30.04 Units: g	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090905.D	10	10/27/16 12:27	10/28/16 13:00	PB94343

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
191-24-2	Benzo(g,h,i)perylene	400	U	160	400	4000	ug/Kg
95-94-3	1,2,4,5-Tetrachlorobenzene	400	U	160	400	4000	ug/Kg
123-91-1	1,4-Dioxane	810	U	160	810	4000	ug/Kg
58-90-2	2,3,4,6-Tetrachlorophenol	400	U	160	400	4000	ug/Kg
SURROGATES							
367-12-4	2-Fluorophenol	61.3		28 - 127		41%	SPK: 150
13127-88-3	Phenol-d6	82.3		34 - 127		55%	SPK: 150
4165-60-0	Nitrobenzene-d5	63.7		31 - 132		64%	SPK: 100
321-60-8	2-Fluorobiphenyl	47.7		39 - 123		48%	SPK: 100
118-79-6	2,4,6-Tribromophenol	16.4	*	30 - 133		11%	SPK: 150
1718-51-0	Terphenyl-d14	39.4		37 - 115		39%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	179882	6.76				
1146-65-2	Naphthalene-d8	743011	8.05				
15067-26-2	Acenaphthene-d10	404123	9.8				
1517-22-2	Phenanthrene-d10	560707	11.29				
1719-03-5	Chrysene-d12	372607	13.92				
1520-96-3	Perylene-d12	411033	15.33				
TENTATIVE IDENTIFIED COMPOUNDS							
	unknown6.52	2200	J			6.52	ug/Kg
000205-99-2	Benz[e]acephenanthrylene	950	J			14.93	ug/Kg

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051271.D	1		10/26/16 18:28	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	0.61	U	0.61	0.61	6.1	ug/Kg
74-87-3	Chloromethane	0.61	U	0.61	0.61	6.1	ug/Kg
75-01-4	Vinyl Chloride	0.61	U	0.61	0.61	6.1	ug/Kg
74-83-9	Bromomethane	1.2	U	1.2	1.2	6.1	ug/Kg
75-00-3	Chloroethane	0.61	U	0.61	0.61	6.1	ug/Kg
75-69-4	Trichlorofluoromethane	0.61	U	0.61	0.61	6.1	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	0.61	U	0.61	0.61	6.1	ug/Kg
75-35-4	1,1-Dichloroethene	0.61	U	0.61	0.61	6.1	ug/Kg
67-64-1	Acetone	3	U	3	3	30.4	ug/Kg
75-15-0	Carbon Disulfide	0.61	U	0.61	0.61	6.1	ug/Kg
1634-04-4	Methyl tert-butyl Ether	0.61	U	0.61	0.61	6.1	ug/Kg
79-20-9	Methyl Acetate	1.2	U	1.2	1.2	6.1	ug/Kg
75-09-2	Methylene Chloride	7.2		0.61	0.61	6.1	ug/Kg
156-60-5	trans-1,2-Dichloroethene	0.61	U	0.61	0.61	6.1	ug/Kg
75-34-3	1,1-Dichloroethane	0.61	U	0.61	0.61	6.1	ug/Kg
110-82-7	Cyclohexane	0.61	U	0.61	0.61	6.1	ug/Kg
78-93-3	2-Butanone	9.1	U	3.8	9.1	30.4	ug/Kg
56-23-5	Carbon Tetrachloride	0.61	U	0.61	0.61	6.1	ug/Kg
156-59-2	cis-1,2-Dichloroethene	0.61	U	0.61	0.61	6.1	ug/Kg
74-97-5	Bromochloromethane	0.61	U	0.61	0.61	6.1	ug/Kg
67-66-3	Chloroform	0.61	U	0.61	0.61	6.1	ug/Kg
71-55-6	1,1,1-Trichloroethane	0.61	U	0.61	0.61	6.1	ug/Kg
108-87-2	Methylcyclohexane	0.61	U	0.61	0.61	6.1	ug/Kg
71-43-2	Benzene	0.61	U	0.46	0.61	6.1	ug/Kg
107-06-2	1,2-Dichloroethane	0.61	U	0.61	0.61	6.1	ug/Kg
79-01-6	Trichloroethene	2.9	J	0.61	0.61	6.1	ug/Kg
78-87-5	1,2-Dichloropropane	0.61	U	0.32	0.61	6.1	ug/Kg
75-27-4	Bromodichloromethane	0.61	U	0.61	0.61	6.1	ug/Kg
108-10-1	4-Methyl-2-Pentanone	3	U	3	3	30.4	ug/Kg
108-88-3	Toluene	0.61	U	0.61	0.61	6.1	ug/Kg
10061-02-6	t-1,3-Dichloropropene	0.61	U	0.61	0.61	6.1	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	0.61	U	0.61	0.61	6.1	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051271.D	1		10/26/16 18:28	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	1.2	U	1.1	1.2	6.1	ug/Kg
591-78-6	2-Hexanone	3	U	3	3	30.4	ug/Kg
124-48-1	Dibromochloromethane	0.61	U	0.61	0.61	6.1	ug/Kg
106-93-4	1,2-Dibromoethane	0.61	U	0.61	0.61	6.1	ug/Kg
127-18-4	Tetrachloroethene	290	E	0.61	0.61	6.1	ug/Kg
108-90-7	Chlorobenzene	0.61	U	0.61	0.61	6.1	ug/Kg
100-41-4	Ethyl Benzene	2.5	J	0.61	0.61	6.1	ug/Kg
179601-23-1	m/p-Xylenes	9.9	J	0.87	1.2	12.2	ug/Kg
95-47-6	o-Xylene	7.1		0.61	0.61	6.1	ug/Kg
100-42-5	Styrene	0.61	U	0.55	0.61	6.1	ug/Kg
75-25-2	Bromoform	1.8	U	0.9	1.8	6.1	ug/Kg
98-82-8	Isopropylbenzene	1.6	J	0.58	0.61	6.1	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	0.61	U	0.56	0.61	6.1	ug/Kg
541-73-1	1,3-Dichlorobenzene	0.61	U	0.45	0.61	6.1	ug/Kg
106-46-7	1,4-Dichlorobenzene	0.61	U	0.5	0.61	6.1	ug/Kg
95-50-1	1,2-Dichlorobenzene	0.61	U	0.61	0.61	6.1	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	6.1	U	1.1	6.1	6.1	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	0.61	U	0.61	0.61	6.1	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	1.2	U	0.61	1.2	6.1	ug/Kg
123-91-1	1,4-Dioxane	120	U	120	120	120	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	46.9		56 - 120		94%	SPK: 50
1868-53-7	Dibromofluoromethane	36.5		57 - 135		73%	SPK: 50
2037-26-5	Toluene-d8	43.7		67 - 123		87%	SPK: 50
460-00-4	4-Bromofluorobenzene	38.5		33 - 141		77%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	629413	4.76				
540-36-3	1,4-Difluorobenzene	980240	5.48				
3114-55-4	Chlorobenzene-d5	806741	9.65				
3855-82-1	1,4-Dichlorobenzene-d4	298934	12.46				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0	SDG No.:	H5411
Lab Sample ID:	H5411-07	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VF051271.D	1		10/26/16 18:28	VF102616

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0ME	SDG No.:	H5411
Lab Sample ID:	H5411-07ME	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	100 uL	Test:	VOC-TCL
GC Column:	DB-624UI ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VU012875.D	1		10/28/16 12:20	VU102816

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
75-71-8	Dichlorodifluoromethane	60.8	UD	60.8	60.8	610	ug/Kg
74-87-3	Chloromethane	60.8	UD	60.8	60.8	610	ug/Kg
75-01-4	Vinyl Chloride	60.8	UD	60.8	60.8	610	ug/Kg
74-83-9	Bromomethane	120	UD	120	120	610	ug/Kg
75-00-3	Chloroethane	60.8	UD	60.8	60.8	610	ug/Kg
75-69-4	Trichlorofluoromethane	60.8	UD	60.8	60.8	610	ug/Kg
76-13-1	1,1,2-Trichlorotrifluoroethane	60.8	UD	60.8	60.8	610	ug/Kg
75-35-4	1,1-Dichloroethene	60.8	UD	60.8	60.8	610	ug/Kg
67-64-1	Acetone	300	UD	300	300	3000	ug/Kg
75-15-0	Carbon Disulfide	60.8	UD	60.8	60.8	610	ug/Kg
1634-04-4	Methyl tert-butyl Ether	60.8	UD	60.8	60.8	610	ug/Kg
79-20-9	Methyl Acetate	120	UD	120	120	610	ug/Kg
75-09-2	Methylene Chloride	60.8	UD	60.8	60.8	610	ug/Kg
156-60-5	trans-1,2-Dichloroethene	60.8	UD	60.8	60.8	610	ug/Kg
75-34-3	1,1-Dichloroethane	60.8	UD	60.8	60.8	610	ug/Kg
110-82-7	Cyclohexane	60.8	UD	60.8	60.8	610	ug/Kg
78-93-3	2-Butanone	910	UD	380	910	3000	ug/Kg
56-23-5	Carbon Tetrachloride	60.8	UD	60.8	60.8	610	ug/Kg
156-59-2	cis-1,2-Dichloroethene	60.8	UD	60.8	60.8	610	ug/Kg
74-97-5	Bromochloromethane	60.8	UD	60.8	60.8	610	ug/Kg
67-66-3	Chloroform	60.8	UD	60.8	60.8	610	ug/Kg
71-55-6	1,1,1-Trichloroethane	60.8	UD	60.8	60.8	610	ug/Kg
108-87-2	Methylcyclohexane	60.8	UD	60.8	60.8	610	ug/Kg
71-43-2	Benzene	60.8	UD	46.2	60.8	610	ug/Kg
107-06-2	1,2-Dichloroethane	60.8	UD	60.8	60.8	610	ug/Kg
79-01-6	Trichloroethene	60.8	UD	60.8	60.8	610	ug/Kg
78-87-5	1,2-Dichloropropane	60.8	UD	31.6	60.8	610	ug/Kg
75-27-4	Bromodichloromethane	60.8	UD	60.8	60.8	610	ug/Kg
108-10-1	4-Methyl-2-Pentanone	300	UD	300	300	3000	ug/Kg
108-88-3	Toluene	60.8	UD	60.8	60.8	610	ug/Kg
10061-02-6	t-1,3-Dichloropropene	60.8	UD	60.8	60.8	610	ug/Kg
10061-01-5	cis-1,3-Dichloropropene	60.8	UD	60.8	60.8	610	ug/Kg

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0ME	SDG No.:	H5411
Lab Sample ID:	H5411-07ME	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	100 uL	Test:	VOC-TCL
GC Column:	DB-624UI ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VU012875.D	1		10/28/16 12:20	VU102816

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
79-00-5	1,1,2-Trichloroethane	120	UD	110	120	610	ug/Kg
591-78-6	2-Hexanone	300	UD	300	300	3000	ug/Kg
124-48-1	Dibromochloromethane	60.8	UD	60.8	60.8	610	ug/Kg
106-93-4	1,2-Dibromoethane	60.8	UD	60.8	60.8	610	ug/Kg
127-18-4	Tetrachloroethene	210	JD	60.8	60.8	610	ug/Kg
108-90-7	Chlorobenzene	60.8	UD	60.8	60.8	610	ug/Kg
100-41-4	Ethyl Benzene	60.8	UD	60.8	60.8	610	ug/Kg
179601-23-1	m/p-Xylenes	120	UD	87.5	120	1200	ug/Kg
95-47-6	o-Xylene	60.8	UD	60.8	60.8	610	ug/Kg
100-42-5	Styrene	60.8	UD	54.7	60.8	610	ug/Kg
75-25-2	Bromoform	180	UD	89.9	180	610	ug/Kg
98-82-8	Isopropylbenzene	60.8	UD	58.3	60.8	610	ug/Kg
79-34-5	1,1,2,2-Tetrachloroethane	60.8	UD	55.9	60.8	610	ug/Kg
541-73-1	1,3-Dichlorobenzene	60.8	UD	45	60.8	610	ug/Kg
106-46-7	1,4-Dichlorobenzene	60.8	UD	49.8	60.8	610	ug/Kg
95-50-1	1,2-Dichlorobenzene	60.8	UD	60.8	60.8	610	ug/Kg
96-12-8	1,2-Dibromo-3-Chloropropane	610	UD	110	610	610	ug/Kg
120-82-1	1,2,4-Trichlorobenzene	60.8	UD	60.8	60.8	610	ug/Kg
87-61-6	1,2,3-Trichlorobenzene	120	UD	60.8	120	610	ug/Kg
123-91-1	1,4-Dioxane	12200	UD	12200	12200	12200	ug/Kg
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	47.5		56 - 120		95%	SPK: 50
1868-53-7	Dibromofluoromethane	47.4		57 - 135		95%	SPK: 50
2037-26-5	Toluene-d8	46.4		67 - 123		93%	SPK: 50
460-00-4	4-Bromofluorobenzene	40.3		33 - 141		81%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	623364	4.99				
540-36-3	1,4-Difluorobenzene	1019310	5.9				
3114-55-4	Chlorobenzene-d5	863466	9.1				
3855-82-1	1,4-Dichlorobenzene-d4	381976	11.49				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-3.5-4.0ME	SDG No.:	H5411
Lab Sample ID:	H5411-07ME	Matrix:	SOIL
Analytical Method:	SW8260	% Moisture:	17.7
Sample Wt/Vol:	5 Units: g	Final Vol:	10000 uL
Soil Aliquot Vol:	100 uL	Test:	VOC-TCL
GC Column:	DB-624UI ID : 0.18	Level :	MED

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VU012875.D	1		10/28/16 12:20	VU102816

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16 11:00
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-08	Matrix:	SOIL
		% Solid:	82.4

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Corrosivity	10.7		1	0	0	0	pH		10/26/16 16:34	9045C
Ignitability	NO		1	0	0	0	oC		10/28/16 12:30	
Reactive Cyanide	0.05	U	1	0.05	0.05	0.05	mg/Kg	10/28/16 11:19	10/28/16 15:09	9012B
Reactive Sulfide	30.2		1	10	10	10	mg/Kg	10/29/16 10:20	10/29/16 13:25	9034

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-08	Matrix:	SOIL
Analytical Method:	8015B DRO	% Moisture:	17.6 Decanted:
Sample Wt/Vol:	30.06 Units: g	Final Vol:	1 mL
Soil Aliquot Vol:	uL	Test:	Diesel Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
FC024423.D	1	10/27/16 08:00	10/28/16 11:16	PB94336

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
DRO	DRO	35003		1010	1010	2020	ug/kg
SURROGATES							
16416-32-3	Tetracosane-d50	21.3		37 - 130		106%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-08	Matrix:	SOIL
Analytical Method:	8015B GRO	% Moisture:	17.6 Decanted:
Sample Wt/Vol:	5.03 Units: g	Final Vol:	5 mL
Soil Aliquot Vol:	uL	Test:	Gasoline Range Organics
Extraction Type:		Injection Volume :	
GPC Factor :	PH :		

File ID/Qc Batch:	Dilution:	Date Analyzed	Prep Batch ID
FB007693.D	1	11/01/16 14:26	FB110116

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units(Dry Weight)
TARGETS							
GRO	GRO	16	J	14	27	54	ug/kg
SURROGATES							
98-08-8	Alpha,Alpha,Alpha-Trifluoroto	14.5		50 - 150		72%	SPK: 20

Comments:

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J = Estimated Value
B = Analyte Found in Associated Method Blank
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* = Values outside of QC limits
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S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	SB-03-COMP	SDG No.:	H5411
Lab Sample ID:	H5411-08	Matrix:	TCLP
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-38-2	Arsenic	31.2	J	1	25	25.0	100	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7440-39-3	Barium	258	J	1	40	125	500	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7440-43-9	Cadmium	7.5	U	1	5	7.5	30	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7440-47-3	Chromium	12.5	U	1	11	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7439-92-1	Lead	15	U	1	15	15.0	60	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7439-97-6	Mercury	1	U	1	1	1.0	2	ug/L	10/28/16 12:53	10/28/16 17:27	SW7470A
7782-49-2	Selenium	50	U	1	48	50.0	100	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010
7440-22-4	Silver	12.5	U	1	12.5	12.5	50	ug/L	10/28/16 12:00	10/28/16 16:59	SW6010

Color Before:	Colorless	Clarity Before:		Texture:	Clear
Color After:	Colorless	Clarity After:		Artifacts:	Clear
Comments:	TCLP METALS				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	1770	N	1	6.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-36-0	Antimony	6.25	UN	1	6.25	6.25	25	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-38-2	Arsenic	67	N	1	2.5	2.5	10	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-39-3	Barium	234	N	1	4	12.5	50	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-41-7	Beryllium	0.75	UN	1	0.7	0.75	3	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-43-9	Cadmium	0.75	U	1	0.5	0.75	3	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-70-2	Calcium	174000		1	31.8	250	1000	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-47-3	Chromium	13		1	1.1	1.25	5	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-48-4	Cobalt	3.75	U	1	3.75	3.75	15	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-50-8	Copper	8.99	J	1	2	2.5	10	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7439-89-6	Iron	2780	N	1	12.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7439-92-1	Lead	33.6		1	1.5	1.5	6	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7439-95-4	Magnesium	183000		1	32.5	250	1000	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7439-96-5	Manganese	354	N	1	1.7	2.5	10	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7439-97-6	Mercury	0.413		1	0.1	0.1	0.2	ug/L	10/27/16 15:54	10/28/16 11:47	SW7470A
7440-02-0	Nickel	8.82	J	1	4.2	5.0	20	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-09-7	Potassium	99700		1	38.8	250	1000	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-22-4	Silver	1.25	U	1	1.25	1.25	5	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-23-5	Sodium	1070000		1	13.9	250	1000	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-28-0	Thallium	5	U	1	2.4	5.0	20	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-62-2	Vanadium	5.65	J	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010
7440-66-6	Zinc	21.1		1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 13:42	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
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* = indicates the duplicate analysis is not within control limits.
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	980 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030811.D	1	10/28/16 08:15	11/01/16 14:27	PB94362

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.102	U	0.098	0.102	0.51	ug/L
11104-28-2	Aroclor-1221	0.102	U	0.102	0.102	0.51	ug/L
11141-16-5	Aroclor-1232	0.102	U	0.102	0.102	0.51	ug/L
53469-21-9	Aroclor-1242	0.102	U	0.0908	0.102	0.51	ug/L
12672-29-6	Aroclor-1248	0.102	U	0.102	0.102	0.51	ug/L
11097-69-1	Aroclor-1254	0.102	U	0.0449	0.102	0.51	ug/L
37324-23-5	Aroclor-1262	0.102	U	0.0827	0.102	0.51	ug/L
11100-14-4	Aroclor-1268	0.102	U	0.0827	0.102	0.51	ug/L
11096-82-5	Aroclor-1260	0.102	U	0.0827	0.102	0.51	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	25		35 - 137		125%	SPK: 20
2051-24-3	Decachlorobiphenyl	15.6		40 - 135		78%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	980 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021060.D	1	10/28/16 08:16	10/29/16 00:28	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.0052	0.0102	0.051	ug/L
319-85-7	beta-BHC	0.01	U	0.0088	0.0102	0.051	ug/L
319-86-8	delta-BHC	0.01	U	0.0057	0.0102	0.051	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.0056	0.0102	0.051	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.0102	0.051	ug/L
309-00-2	Aldrin	0.01	U	0.0063	0.0102	0.051	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.0068	0.0102	0.051	ug/L
959-98-8	Endosulfan I	0.01	U	0.0062	0.0102	0.051	ug/L
60-57-1	Dieldrin	0.01	U	0.0051	0.0102	0.051	ug/L
72-55-9	4,4-DDE	0.01	U	0.0051	0.0102	0.051	ug/L
72-20-8	Endrin	0.01	U	0.0059	0.0102	0.051	ug/L
33213-65-9	Endosulfan II	0.01	U	0.0056	0.0102	0.051	ug/L
72-54-8	4,4-DDD	0.01	U	0.0072	0.0102	0.051	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.0061	0.0102	0.051	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.0102	0.051	ug/L
72-43-5	Methoxychlor	0.01	U	0.0051	0.0102	0.051	ug/L
53494-70-5	Endrin ketone	0.01	U	0.0058	0.0102	0.051	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.0051	0.0102	0.051	ug/L
5103-71-9	alpha-Chlordane	0.01	U	0.0051	0.0102	0.051	ug/L
5103-74-2	gamma-Chlordane	0.01	U	0.0051	0.0102	0.051	ug/L
8001-35-2	Toxaphene	0.102	U	0.102	0.102	0.51	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	13.2		10 - 192		66%	SPK: 20
877-09-8	Tetrachloro-m-xylene	18.6		10 - 172		93%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	980 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021060.D	1	10/28/16 08:16	10/29/16 00:28	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
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LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090924.D	1	10/28/16 08:15	10/31/16 13:28	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	1	U	0.79	1	10.3	ug/L
108-95-2	Phenol	1	U	0.22	1	10.3	ug/L
111-44-4	bis(2-Chloroethyl)ether	1	U	0.57	1	10.3	ug/L
95-57-8	2-Chlorophenol	1	U	0.56	1	10.3	ug/L
95-48-7	2-Methylphenol	1	U	0.25	1	10.3	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.18	1	10.3	ug/L
98-86-2	Acetophenone	1	U	0.14	1	10.3	ug/L
65794-96-9	3+4-Methylphenols	1	U	0.39	1	10.3	ug/L
621-64-7	n-Nitroso-di-n-propylamine	1	U	0.21	1	10.3	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.3	ug/L
98-95-3	Nitrobenzene	1	U	0.7	1	10.3	ug/L
78-59-1	Isophorone	1	U	0.31	1	10.3	ug/L
88-75-5	2-Nitrophenol	1	U	0.54	1	10.3	ug/L
105-67-9	2,4-Dimethylphenol	1	U	0.73	1	10.3	ug/L
111-91-1	bis(2-Chloroethoxy)methane	1	U	0.57	1	10.3	ug/L
120-83-2	2,4-Dichlorophenol	1	U	0.68	1	10.3	ug/L
91-20-3	Naphthalene	1	U	0.12	1	10.3	ug/L
106-47-8	4-Chloroaniline	1	U	1	1	10.3	ug/L
87-68-3	Hexachlorobutadiene	1	U	0.26	1	10.3	ug/L
105-60-2	Caprolactam	1	U	1	1	10.3	ug/L
59-50-7	4-Chloro-3-methylphenol	1	U	0.41	1	10.3	ug/L
91-57-6	2-Methylnaphthalene	1	U	0.33	1	10.3	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.25	1	10.3	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.58	1	10.3	ug/L
95-95-4	2,4,5-Trichlorophenol	1	U	0.41	1	10.3	ug/L
92-52-4	1,1-Biphenyl	1	U	0.15	1	10.3	ug/L
91-58-7	2-Chloronaphthalene	1	U	0.16	1	10.3	ug/L
88-74-4	2-Nitroaniline	1	U	0.51	1	10.3	ug/L
131-11-3	Dimethylphthalate	6.9	J	0.23	1	10.3	ug/L
208-96-8	Acenaphthylene	1	U	0.72	1	10.3	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.33	1	10.3	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090924.D	1	10/28/16 08:15	10/31/16 13:28	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
99-09-2	3-Nitroaniline	1	U	1	1	10.3	ug/L
83-32-9	Acenaphthene	1	U	0.22	1	10.3	ug/L
51-28-5	2,4-Dinitrophenol	8.2	U	2.2	8.2	10.3	ug/L
100-02-7	4-Nitrophenol	5.2	U	2.1	5.2	10.3	ug/L
132-64-9	Dibenzofuran	1	U	0.25	1	10.3	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10.3	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.3	ug/L
7005-72-3	4-Chlorophenyl-phenylether	1	U	0.22	1	10.3	ug/L
86-73-7	Fluorene	1	U	0.32	1	10.3	ug/L
100-01-6	4-Nitroaniline	2.1	U	1.4	2.1	10.3	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2.1	U	0.76	2.1	10.3	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.62	1	10.3	ug/L
101-55-3	4-Bromophenyl-phenylether	1	U	0.24	1	10.3	ug/L
118-74-1	Hexachlorobenzene	1	U	0.19	1	10.3	ug/L
1912-24-9	Atrazine	1	U	0.41	1	10.3	ug/L
87-86-5	Pentachlorophenol	1	U	1	1	10.3	ug/L
85-01-8	Phenanthrene	1	U	0.27	1	10.3	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.3	ug/L
86-74-8	Carbazole	1	U	0.23	1	10.3	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.3	ug/L
206-44-0	Fluoranthene	1	U	0.41	1	10.3	ug/L
129-00-0	Pyrene	1	U	0.21	1	10.3	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.2	1	10.3	ug/L
91-94-1	3,3-Dichlorobenzidine	1	U	1	1	10.3	ug/L
56-55-3	Benzo(a)anthracene	1	U	0.16	1	10.3	ug/L
218-01-9	Chrysene	1	U	0.19	1	10.3	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10.3	ug/L
117-84-0	Di-n-octyl phthalate	1	U	0.53	1	10.3	ug/L
205-99-2	Benzo(b)fluoranthene	1	U	0.3	1	10.3	ug/L
207-08-9	Benzo(k)fluoranthene	1	U	0.19	1	10.3	ug/L
50-32-8	Benzo(a)pyrene	1	U	0.14	1	10.3	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	1	U	0.15	1	10.3	ug/L
53-70-3	Dibenzo(a,h)anthracene	1	U	0.43	1	10.3	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090924.D	1	10/28/16 08:15	10/31/16 13:28	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
191-24-2	Benzo(g,h,i)perylene	1	U	0.3	1	10.3	ug/L
95-94-3	1,2,4,5-Tetrachlorobenzene	1	U	0.21	1	10.3	ug/L
123-91-1	1,4-Dioxane	5.2	U	0.21	5.2	10.3	ug/L
58-90-2	2,3,4,6-Tetrachlorophenol	1	U	0.21	1	10.3	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	78.1		10 - 130		52%	SPK: 150
13127-88-3	Phenol-d6	47.9		10 - 130		32%	SPK: 150
4165-60-0	Nitrobenzene-d5	84.7		36 - 131		85%	SPK: 100
321-60-8	2-Fluorobiphenyl	110		39 - 131		106%	SPK: 100
118-79-6	2,4,6-Tribromophenol	150		25 - 155		101%	SPK: 150
1718-51-0	Terphenyl-d14	130		23 - 130		130%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	144461	6.75				
1146-65-2	Naphthalene-d8	677367	8.03				
15067-26-2	Acenaphthene-d10	316266	9.79				
1517-22-2	Phenanthrene-d10	549626	11.26				
1719-03-5	Chrysene-d12	344301	13.91				
1520-96-3	Perylene-d12	341379	15.3				
TENTATIVE IDENTIFIED COMPOUNDS							
000123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	6.7	A			4.9	ug/L
	unknown6.51	100	J			6.51	ug/L
006222-07-7	Pentafluoropropionic acid, hexadec	2.5	J			8.99	ug/L
	unknown9.02	3.9	J			9.02	ug/L
	unknown9.45	2.9	J			9.45	ug/L
	unknown9.65	2.3	J			9.65	ug/L
1000215-29-8	4-Methyl-exo-tricyclo[6.2.1.0(2.7)	2.5	J			9.98	ug/L
004385-47-1	1,4-Dioxaspiro[4.5]deca-6,9-diene-	4.7	J			10.08	ug/L
1000292-83-8	Limonene-1,2-epoxide(fr.2)	2.2	J			10.13	ug/L
001424-36-8	2.alpha., 4a.alpha., 8a.alpha.-Dec	2.6	J			10.35	ug/L
1000223-36-2	N-(.alpha.-Methyl-4-nitrobenzylide	2.9	J			10.76	ug/L
000057-10-3	n-Hexadecanoic acid	7	J			11.82	ug/L
000057-11-4	Octadecanoic acid	14.1	J			12.61	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	970 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090924.D	1	10/28/16 08:15	10/31/16 13:28	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
013674-87-8	Tris(1,3-dichloroisopropyl)phospha	2.1	J			13.24	ug/L
077899-03-7	1-Heneicosyl formate	2.9	J			13.76	ug/L
126848-01-9	3,5,6-Trimethyl-p-quinone, 2-(2,5-	2.3	J			14.91	ug/L

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036795.D	1		10/27/16 17:28	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	2.2	J	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
74-97-5	Bromochloromethane	0.5	U	0.2	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036795.D	1		10/27/16 17:28	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
123-91-1	1,4-Dioxane	100	U	100	100	100	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.9		61 - 141		108%	SPK: 50
1868-53-7	Dibromofluoromethane	51.1		69 - 133		102%	SPK: 50
2037-26-5	Toluene-d8	49.7		65 - 126		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	47.7		58 - 135		95%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	261859	7.86				
540-36-3	1,4-Difluorobenzene	469031	8.78				
3114-55-4	Chlorobenzene-d5	481698	11.58				
3855-82-1	1,4-Dichlorobenzene-d4	214019	13.52				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-09	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036795.D	1		10/27/16 17:28	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	1770	N	1	6.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-36-0	Antimony	6.25	UN	1	6.25	6.25	25	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-38-2	Arsenic	68.6	N	1	2.5	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-39-3	Barium	234	N	1	4	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-41-7	Beryllium	0.75	UN	1	0.7	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-43-9	Cadmium	0.75	U	1	0.5	0.75	3‘	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-70-2	Calcium	178000		1	31.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-47-3	Chromium	7.87		1	1.1	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-48-4	Cobalt	3.75	U	1	3.75	3.75	15	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-50-8	Copper	7.68	J	1	2	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7439-89-6	Iron	2870	N	1	12.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7439-92-1	Lead	36.4		1	1.5	1.5	6	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7439-95-4	Magnesium	184000		1	32.5	250	1000	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7439-96-5	Manganese	376	N	1	1.7	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7439-97-6	Mercury	0.292		1	0.1	0.1	0.2	ug/L	10/27/16 15:54	10/28/16 12:00	SW7470A
7440-02-0	Nickel	6.76	J	1	4.2	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-09-7	Potassium	102000		1	38.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-22-4	Silver	1.25	U	1	1.25	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-23-5	Sodium	932000		1	13.9	250	1000	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-28-0	Thallium	5	U	1	2.4	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-62-2	Vanadium	5.79	J	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010
7440-66-6	Zinc	21.3		1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:17	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	990 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030812.D	1	10/28/16 08:15	11/01/16 14:43	PB94362

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.101	U	0.097	0.101	0.505	ug/L
11104-28-2	Aroclor-1221	0.101	U	0.101	0.101	0.505	ug/L
11141-16-5	Aroclor-1232	0.101	U	0.101	0.101	0.505	ug/L
53469-21-9	Aroclor-1242	0.101	U	0.0899	0.101	0.505	ug/L
12672-29-6	Aroclor-1248	0.101	U	0.101	0.101	0.505	ug/L
11097-69-1	Aroclor-1254	0.101	U	0.0444	0.101	0.505	ug/L
37324-23-5	Aroclor-1262	0.101	U	0.0818	0.101	0.505	ug/L
11100-14-4	Aroclor-1268	0.101	U	0.0818	0.101	0.505	ug/L
11096-82-5	Aroclor-1260	0.101	U	0.0818	0.101	0.505	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	24.9		35 - 137		124%	SPK: 20
2051-24-3	Decachlorobiphenyl	17.6		40 - 135		88%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021061.D	1	10/28/16 08:16	10/29/16 00:42	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.0053	0.0103	0.0515	ug/L
319-85-7	beta-BHC	0.01	U	0.0089	0.0103	0.0515	ug/L
319-86-8	delta-BHC	0.01	U	0.0058	0.0103	0.0515	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.0057	0.0103	0.0515	ug/L
76-44-8	Heptachlor	0.01	U	0.0071	0.0103	0.0515	ug/L
309-00-2	Aldrin	0.01	U	0.0064	0.0103	0.0515	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.0069	0.0103	0.0515	ug/L
959-98-8	Endosulfan I	0.01	U	0.0063	0.0103	0.0515	ug/L
60-57-1	Dieldrin	0.01	U	0.0052	0.0103	0.0515	ug/L
72-55-9	4,4-DDE	0.01	U	0.0052	0.0103	0.0515	ug/L
72-20-8	Endrin	0.01	U	0.006	0.0103	0.0515	ug/L
33213-65-9	Endosulfan II	0.01	U	0.0057	0.0103	0.0515	ug/L
72-54-8	4,4-DDD	0.01	U	0.0073	0.0103	0.0515	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.0062	0.0103	0.0515	ug/L
50-29-3	4,4-DDT	0.01	U	0.0061	0.0103	0.0515	ug/L
72-43-5	Methoxychlor	0.01	U	0.0052	0.0103	0.0515	ug/L
53494-70-5	Endrin ketone	0.01	U	0.0059	0.0103	0.0515	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.0052	0.0103	0.0515	ug/L
5103-71-9	alpha-Chlordane	0.01	U	0.0052	0.0103	0.0515	ug/L
5103-74-2	gamma-Chlordane	0.01	U	0.0052	0.0103	0.0515	ug/L
8001-35-2	Toxaphene	0.103	U	0.103	0.103	0.516	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	17.6		10 - 192		88%	SPK: 20
877-09-8	Tetrachloro-m-xylene	18.6		10 - 172		93%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	970 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021061.D	1	10/28/16 08:16	10/29/16 00:42	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090925.D	1	10/28/16 08:15	10/31/16 13:55	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	1	U	0.78	1	10.1	ug/L
108-95-2	Phenol	1	U	0.21	1	10.1	ug/L
111-44-4	bis(2-Chloroethyl)ether	1	U	0.56	1	10.1	ug/L
95-57-8	2-Chlorophenol	1	U	0.55	1	10.1	ug/L
95-48-7	2-Methylphenol	1	U	0.24	1	10.1	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10.1	ug/L
98-86-2	Acetophenone	1	U	0.14	1	10.1	ug/L
65794-96-9	3+4-Methylphenols	1	U	0.38	1	10.1	ug/L
621-64-7	n-Nitroso-di-n-propylamine	1	U	0.2	1	10.1	ug/L
67-72-1	Hexachloroethane	1	U	0.25	1	10.1	ug/L
98-95-3	Nitrobenzene	1	U	0.69	1	10.1	ug/L
78-59-1	Isophorone	1	U	0.3	1	10.1	ug/L
88-75-5	2-Nitrophenol	1	U	0.53	1	10.1	ug/L
105-67-9	2,4-Dimethylphenol	1	U	0.72	1	10.1	ug/L
111-91-1	bis(2-Chloroethoxy)methane	1	U	0.56	1	10.1	ug/L
120-83-2	2,4-Dichlorophenol	1	U	0.67	1	10.1	ug/L
91-20-3	Naphthalene	1	U	0.12	1	10.1	ug/L
106-47-8	4-Chloroaniline	1	U	1	1	10.1	ug/L
87-68-3	Hexachlorobutadiene	1	U	0.25	1	10.1	ug/L
105-60-2	Caprolactam	1	U	1	1	10.1	ug/L
59-50-7	4-Chloro-3-methylphenol	1	U	0.4	1	10.1	ug/L
91-57-6	2-Methylnaphthalene	1	U	0.32	1	10.1	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10.1	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.57	1	10.1	ug/L
95-95-4	2,4,5-Trichlorophenol	1	U	0.4	1	10.1	ug/L
92-52-4	1,1-Biphenyl	1	U	0.15	1	10.1	ug/L
91-58-7	2-Chloronaphthalene	1	U	0.16	1	10.1	ug/L
88-74-4	2-Nitroaniline	1	U	0.49	1	10.1	ug/L
131-11-3	Dimethylphthalate	4.1	J	0.22	1	10.1	ug/L
208-96-8	Acenaphthylene	1	U	0.71	1	10.1	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.32	1	10.1	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090925.D	1	10/28/16 08:15	10/31/16 13:55	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
99-09-2	3-Nitroaniline	1	U	1	1	10.1	ug/L
83-32-9	Acenaphthene	1	U	0.21	1	10.1	ug/L
51-28-5	2,4-Dinitrophenol	8.1	U	2.1	8.1	10.1	ug/L
100-02-7	4-Nitrophenol	5.1	U	2	5.1	10.1	ug/L
132-64-9	Dibenzofuran	1	U	0.24	1	10.1	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10.1	ug/L
84-66-2	Diethylphthalate	1	U	0.38	1	10.1	ug/L
7005-72-3	4-Chlorophenyl-phenylether	1	U	0.21	1	10.1	ug/L
86-73-7	Fluorene	1	U	0.31	1	10.1	ug/L
100-01-6	4-Nitroaniline	2	U	1.4	2	10.1	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.75	2	10.1	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.61	1	10.1	ug/L
101-55-3	4-Bromophenyl-phenylether	1	U	0.23	1	10.1	ug/L
118-74-1	Hexachlorobenzene	1	U	0.18	1	10.1	ug/L
1912-24-9	Atrazine	1	U	0.4	1	10.1	ug/L
87-86-5	Pentachlorophenol	1	U	1	1	10.1	ug/L
85-01-8	Phenanthrene	1	U	0.26	1	10.1	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.1	ug/L
86-74-8	Carbazole	1	U	0.22	1	10.1	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.1	ug/L
206-44-0	Fluoranthene	1	U	0.4	1	10.1	ug/L
129-00-0	Pyrene	1	U	0.2	1	10.1	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10.1	ug/L
91-94-1	3,3-Dichlorobenzidine	1	U	1	1	10.1	ug/L
56-55-3	Benzo(a)anthracene	1	U	0.16	1	10.1	ug/L
218-01-9	Chrysene	1	U	0.18	1	10.1	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	1	U	0.16	1	10.1	ug/L
117-84-0	Di-n-octyl phthalate	1	U	0.52	1	10.1	ug/L
205-99-2	Benzo(b)fluoranthene	1	U	0.29	1	10.1	ug/L
207-08-9	Benzo(k)fluoranthene	1	U	0.18	1	10.1	ug/L
50-32-8	Benzo(a)pyrene	1	U	0.14	1	10.1	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	1	U	0.15	1	10.1	ug/L
53-70-3	Dibenzo(a,h)anthracene	1	U	0.42	1	10.1	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090925.D	1	10/28/16 08:15	10/31/16 13:55	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
191-24-2	Benzo(g,h,i)perylene	1	U	0.29	1	10.1	ug/L
95-94-3	1,2,4,5-Tetrachlorobenzene	1	U	0.2	1	10.1	ug/L
123-91-1	1,4-Dioxane	5.1	U	0.2	5.1	10.1	ug/L
58-90-2	2,3,4,6-Tetrachlorophenol	1	U	0.2	1	10.1	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	68.6		10 - 130		46%	SPK: 150
13127-88-3	Phenol-d6	43.2		10 - 130		29%	SPK: 150
4165-60-0	Nitrobenzene-d5	91.3		36 - 131		91%	SPK: 100
321-60-8	2-Fluorobiphenyl	100		39 - 131		104%	SPK: 100
118-79-6	2,4,6-Tribromophenol	140		25 - 155		96%	SPK: 150
1718-51-0	Terphenyl-d14	140	*	23 - 130		135%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	152263	6.75				
1146-65-2	Naphthalene-d8	661568	8.03				
15067-26-2	Acenaphthene-d10	327111	9.78				
1517-22-2	Phenanthrene-d10	479922	11.26				
1719-03-5	Chrysene-d12	311424	13.91				
1520-96-3	Perylene-d12	343681	15.3				
TENTATIVE IDENTIFIED COMPOUNDS							
000123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	6	A			4.9	ug/L
	unknown6.51	79.9	J			6.51	ug/L
	unknown9.42	2.1	J			9.42	ug/L
1000211-16-7	3-Ethylidenecycloheptene	4	J			9.6	ug/L
	unknown9.65	2.1	J			9.65	ug/L
000766-53-0	Bicyclo[2.2.2]octane, 2-methyl-	2.3	J			10.13	ug/L
	unknown13.31	4.9	J			13.31	ug/L
	unknown13.55	3.4	J			13.55	ug/L
1000131-11-8	Z-5-Nonadecene	3.2	J			13.76	ug/L
000192-97-2	Benzo[e]pyrene	2.3	J			15.19	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup : N	PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090925.D	1	10/28/16 08:15	10/31/16 13:55	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036796.D	1		10/27/16 17:55	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	1.5	J	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
74-97-5	Bromochloromethane	0.5	U	0.2	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036796.D	1		10/27/16 17:55	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
123-91-1	1,4-Dioxane	100	U	100	100	100	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53		61 - 141		106%	SPK: 50
1868-53-7	Dibromofluoromethane	51.2		69 - 133		102%	SPK: 50
2037-26-5	Toluene-d8	50.2		65 - 126		100%	SPK: 50
460-00-4	4-Bromofluorobenzene	48.5		58 - 135		97%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	261543	7.86				
540-36-3	1,4-Difluorobenzene	464128	8.78				
3114-55-4	Chlorobenzene-d5	486222	11.58				
3855-82-1	1,4-Dichlorobenzene-d4	218771	13.52				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-10	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036796.D	1		10/27/16 17:55	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	12.5	UN	1	6.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-36-0	Antimony	6.25	UN	1	6.25	6.25	25	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-38-2	Arsenic	2.5	UN	1	2.5	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-39-3	Barium	12.5	UN	1	4	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-41-7	Beryllium	0.75	UN	1	0.7	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-43-9	Cadmium	0.75	U	1	0.5	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-70-2	Calcium	250	U	1	31.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-47-3	Chromium	1.25	U	1	1.1	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-48-4	Cobalt	3.75	U	1	3.75	3.75	15	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-50-8	Copper	2.5	U	1	2	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7439-89-6	Iron	12.5	UN	1	12.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7439-92-1	Lead	1.5	U	1	1.5	1.5	6	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7439-95-4	Magnesium	250	U	1	32.5	250	1000	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7439-96-5	Manganese	2.5	UN	1	1.7	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	10/27/16 15:54	10/28/16 12:02	SW7470A
7440-02-0	Nickel	5	U	1	4.2	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-09-7	Potassium	39.3	J	1	38.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-22-4	Silver	1.25	U	1	1.25	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-23-5	Sodium	635	J	1	13.9	250	1000	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-28-0	Thallium	5	U	1	2.4	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-62-2	Vanadium	5	U	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010
7440-66-6	Zinc	5	U	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:21	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	1000 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030819.D	1	10/28/16 08:15	11/01/16 19:00	PB94362

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.1	U	0.096	0.1	0.5	ug/L
11104-28-2	Aroclor-1221	0.1	U	0.1	0.1	0.5	ug/L
11141-16-5	Aroclor-1232	0.1	U	0.1	0.1	0.5	ug/L
53469-21-9	Aroclor-1242	0.1	U	0.089	0.1	0.5	ug/L
12672-29-6	Aroclor-1248	0.1	U	0.1	0.1	0.5	ug/L
11097-69-1	Aroclor-1254	0.1	U	0.044	0.1	0.5	ug/L
37324-23-5	Aroclor-1262	0.1	U	0.081	0.1	0.5	ug/L
11100-14-4	Aroclor-1268	0.1	U	0.081	0.1	0.5	ug/L
11096-82-5	Aroclor-1260	0.1	U	0.081	0.1	0.5	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	26		35 - 137		130%	SPK: 20
2051-24-3	Decachlorobiphenyl	18		40 - 135		90%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	990 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021062.D	1	10/28/16 08:16	10/29/16 00:55	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
319-84-6	alpha-BHC	0.01	U	0.0052	0.0101	0.0505	ug/L
319-85-7	beta-BHC	0.01	U	0.0087	0.0101	0.0505	ug/L
319-86-8	delta-BHC	0.01	U	0.0057	0.0101	0.0505	ug/L
58-89-9	gamma-BHC (Lindane)	0.01	U	0.0056	0.0101	0.0505	ug/L
76-44-8	Heptachlor	0.01	U	0.007	0.0101	0.0505	ug/L
309-00-2	Aldrin	0.01	U	0.0063	0.0101	0.0505	ug/L
1024-57-3	Heptachlor epoxide	0.01	U	0.0068	0.0101	0.0505	ug/L
959-98-8	Endosulfan I	0.01	U	0.0062	0.0101	0.0505	ug/L
60-57-1	Dieldrin	0.01	U	0.0051	0.0101	0.0505	ug/L
72-55-9	4,4-DDE	0.01	U	0.0051	0.0101	0.0505	ug/L
72-20-8	Endrin	0.01	U	0.0059	0.0101	0.0505	ug/L
33213-65-9	Endosulfan II	0.01	U	0.0056	0.0101	0.0505	ug/L
72-54-8	4,4-DDD	0.01	U	0.0072	0.0101	0.0505	ug/L
1031-07-8	Endosulfan Sulfate	0.01	U	0.0061	0.0101	0.0505	ug/L
50-29-3	4,4-DDT	0.01	U	0.006	0.0101	0.0505	ug/L
72-43-5	Methoxychlor	0.01	U	0.0051	0.0101	0.0505	ug/L
53494-70-5	Endrin ketone	0.01	U	0.0058	0.0101	0.0505	ug/L
7421-93-4	Endrin aldehyde	0.01	U	0.0051	0.0101	0.0505	ug/L
5103-71-9	alpha-Chlordane	0.01	U	0.0051	0.0101	0.0505	ug/L
5103-74-2	gamma-Chlordane	0.01	U	0.0051	0.0101	0.0505	ug/L
8001-35-2	Toxaphene	0.101	U	0.101	0.101	0.505	ug/L
SURROGATES							
2051-24-3	Decachlorobiphenyl	11.4		10 - 192		57%	SPK: 20
877-09-8	Tetrachloro-m-xylene	17.9		10 - 172		89%	SPK: 20

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8081	% Moisture:	100 Decanted:
Sample Wt/Vol:	990 Units: mL	Final Vol:	10000 uL
Soil Aliquot Vol:	uL	Test:	Pesticide-TCL
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PL021062.D	1	10/28/16 08:16	10/29/16 00:55	PB94363

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090923.D	1	10/28/16 08:15	10/31/16 13:00	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
100-52-7	Benzaldehyde	1	U	0.79	1	10.2	ug/L
108-95-2	Phenol	1	U	0.21	1	10.2	ug/L
111-44-4	bis(2-Chloroethyl)ether	1	U	0.56	1	10.2	ug/L
95-57-8	2-Chlorophenol	1	U	0.55	1	10.2	ug/L
95-48-7	2-Methylphenol	1	U	0.24	1	10.2	ug/L
108-60-1	2,2-oxybis(1-Chloropropane)	1	U	0.17	1	10.2	ug/L
98-86-2	Acetophenone	1	U	0.14	1	10.2	ug/L
65794-96-9	3+4-Methylphenols	1	U	0.39	1	10.2	ug/L
621-64-7	n-Nitroso-di-n-propylamine	1	U	0.2	1	10.2	ug/L
67-72-1	Hexachloroethane	1	U	0.26	1	10.2	ug/L
98-95-3	Nitrobenzene	1	U	0.69	1	10.2	ug/L
78-59-1	Isophorone	1	U	0.31	1	10.2	ug/L
88-75-5	2-Nitrophenol	1	U	0.53	1	10.2	ug/L
105-67-9	2,4-Dimethylphenol	1	U	0.72	1	10.2	ug/L
111-91-1	bis(2-Chloroethoxy)methane	1	U	0.56	1	10.2	ug/L
120-83-2	2,4-Dichlorophenol	1	U	0.67	1	10.2	ug/L
91-20-3	Naphthalene	1	U	0.12	1	10.2	ug/L
106-47-8	4-Chloroaniline	1	U	1	1	10.2	ug/L
87-68-3	Hexachlorobutadiene	1	U	0.26	1	10.2	ug/L
105-60-2	Caprolactam	1	U	1	1	10.2	ug/L
59-50-7	4-Chloro-3-methylphenol	1	U	0.41	1	10.2	ug/L
91-57-6	2-Methylnaphthalene	1	U	0.33	1	10.2	ug/L
77-47-4	Hexachlorocyclopentadiene	1	U	0.24	1	10.2	ug/L
88-06-2	2,4,6-Trichlorophenol	1	U	0.57	1	10.2	ug/L
95-95-4	2,4,5-Trichlorophenol	1	U	0.41	1	10.2	ug/L
92-52-4	1,1-Biphenyl	1	U	0.15	1	10.2	ug/L
91-58-7	2-Chloronaphthalene	1	U	0.16	1	10.2	ug/L
88-74-4	2-Nitroaniline	1	U	0.5	1	10.2	ug/L
131-11-3	Dimethylphthalate	1	U	0.22	1	10.2	ug/L
208-96-8	Acenaphthylene	1	U	0.71	1	10.2	ug/L
606-20-2	2,6-Dinitrotoluene	1	U	0.33	1	10.2	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090923.D	1	10/28/16 08:15	10/31/16 13:00	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
99-09-2	3-Nitroaniline	1	U	1	1	10.2	ug/L
83-32-9	Acenaphthene	1	U	0.21	1	10.2	ug/L
51-28-5	2,4-Dinitrophenol	8.2	U	2.1	8.2	10.2	ug/L
100-02-7	4-Nitrophenol	5.1	U	2	5.1	10.2	ug/L
132-64-9	Dibenzofuran	1	U	0.24	1	10.2	ug/L
121-14-2	2,4-Dinitrotoluene	1	U	1	1	10.2	ug/L
84-66-2	Diethylphthalate	1	U	0.39	1	10.2	ug/L
7005-72-3	4-Chlorophenyl-phenylether	1	U	0.21	1	10.2	ug/L
86-73-7	Fluorene	1	U	0.32	1	10.2	ug/L
100-01-6	4-Nitroaniline	2	U	1.4	2	10.2	ug/L
534-52-1	4,6-Dinitro-2-methylphenol	2	U	0.76	2	10.2	ug/L
86-30-6	n-Nitrosodiphenylamine	1	U	0.61	1	10.2	ug/L
101-55-3	4-Bromophenyl-phenylether	1	U	0.23	1	10.2	ug/L
118-74-1	Hexachlorobenzene	1	U	0.18	1	10.2	ug/L
1912-24-9	Atrazine	1	U	0.41	1	10.2	ug/L
87-86-5	Pentachlorophenol	1	U	1	1	10.2	ug/L
85-01-8	Phenanthrene	1	U	0.27	1	10.2	ug/L
120-12-7	Anthracene	1	U	0.16	1	10.2	ug/L
86-74-8	Carbazole	1	U	0.22	1	10.2	ug/L
84-74-2	Di-n-butylphthalate	1	U	1	1	10.2	ug/L
206-44-0	Fluoranthene	1	U	0.41	1	10.2	ug/L
129-00-0	Pyrene	1	U	0.2	1	10.2	ug/L
85-68-7	Butylbenzylphthalate	1	U	0.19	1	10.2	ug/L
91-94-1	3,3-Dichlorobenzidine	1	U	1	1	10.2	ug/L
56-55-3	Benzo(a)anthracene	1	U	0.16	1	10.2	ug/L
218-01-9	Chrysene	1	U	0.18	1	10.2	ug/L
117-81-7	Bis(2-ethylhexyl)phthalate	2.2	J	0.16	1	10.2	ug/L
117-84-0	Di-n-octyl phthalate	1	U	0.52	1	10.2	ug/L
205-99-2	Benzo(b)fluoranthene	1	U	0.3	1	10.2	ug/L
207-08-9	Benzo(k)fluoranthene	1	U	0.18	1	10.2	ug/L
50-32-8	Benzo(a)pyrene	1	U	0.14	1	10.2	ug/L
193-39-5	Indeno(1,2,3-cd)pyrene	1	U	0.15	1	10.2	ug/L
53-70-3	Dibenzo(a,h)anthracene	1	U	0.43	1	10.2	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090923.D	1	10/28/16 08:15	10/31/16 13:00	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
191-24-2	Benzo(g,h,i)perylene	1	U	0.3	1	10.2	ug/L
95-94-3	1,2,4,5-Tetrachlorobenzene	1	U	0.2	1	10.2	ug/L
123-91-1	1,4-Dioxane	5.1	U	0.2	5.1	10.2	ug/L
58-90-2	2,3,4,6-Tetrachlorophenol	1	U	0.2	1	10.2	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	80		10 - 130		53%	SPK: 150
13127-88-3	Phenol-d6	45.1		10 - 130		30%	SPK: 150
4165-60-0	Nitrobenzene-d5	130		36 - 131		129%	SPK: 100
321-60-8	2-Fluorobiphenyl	100		39 - 131		104%	SPK: 100
118-79-6	2,4,6-Tribromophenol	150		25 - 155		103%	SPK: 150
1718-51-0	Terphenyl-d14	130		23 - 130		127%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	167001	6.75				
1146-65-2	Naphthalene-d8	659756	8.03				
15067-26-2	Acenaphthene-d10	356874	9.78				
1517-22-2	Phenanthrene-d10	592577	11.26				
1719-03-5	Chrysene-d12	493735	13.91				
1520-96-3	Perylene-d12	345001	15.3				
TENTATIVE IDENTIFIED COMPOUNDS							
000123-42-2	2-Pentanone, 4-hydroxy-4-methyl-	8.3	A			4.9	ug/L
	unknown6.51	93.4	J			6.51	ug/L
	unknown10.00	2.1	J			10	ug/L
000544-63-8	Tetradecanoic acid	4.7	J			10.93	ug/L
000057-10-3	n-Hexadecanoic acid	41.4	J			11.83	ug/L
087345-53-7	3,5-Dimethoxy-4-hydroxycinnamalde	2.6	J			11.96	ug/L
000057-11-4	Octadecanoic acid	55.7	J			12.61	ug/L
000629-54-9	Hexadecanamide	2.2	J			12.69	ug/L
000638-58-4	Tetradecanamide	4.2	J			13.41	ug/L
1000156-71-2	1,3-Dioxolane, 2-(methoxymethyl)-2	11.7	J			13.77	ug/L
	unknown14.53	4.6	J			14.53	ug/L
000629-94-7	Heneicosane	10.1	J			14.67	ug/L
000111-02-4	2,6,10,14,18,22-Tetracosahexaene,	2.1	J			14.74	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8270	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	SVOC-TCL BNA -20
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BF090923.D	1	10/28/16 08:15	10/31/16 13:00	PB94361

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
000630-02-4	Octacosane	7.9	J			14.98	ug/L
242794-76-9	Bicyclo[5.2.0]nonane, 2-methylene-	2.7	J			17.15	ug/L

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036792.D	1		10/27/16 16:07	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
74-97-5	Bromochloromethane	0.5	U	0.2	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036792.D	1		10/27/16 16:07	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
123-91-1	1,4-Dioxane	100	U	100	100	100	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.7		61 - 141		103%	SPK: 50
1868-53-7	Dibromofluoromethane	50.1		69 - 133		100%	SPK: 50
2037-26-5	Toluene-d8	49.5		65 - 126		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	45.8		58 - 135		92%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	267354	7.87				
540-36-3	1,4-Difluorobenzene	466932	8.78				
3114-55-4	Chlorobenzene-d5	474416	11.58				
3855-82-1	1,4-Dichlorobenzene-d4	202089	13.52				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	EQUIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036792.D	1		10/27/16 16:07	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TRIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036793.D	1		10/27/16 16:34	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
74-97-5	Bromochloromethane	0.5	U	0.2	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TRIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036793.D	1		10/27/16 16:34	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
123-91-1	1,4-Dioxane	100	U	100	100	100	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.9		61 - 141		106%	SPK: 50
1868-53-7	Dibromofluoromethane	50.5		69 - 133		101%	SPK: 50
2037-26-5	Toluene-d8	48.9		65 - 126		98%	SPK: 50
460-00-4	4-Bromofluorobenzene	42.8		58 - 135		86%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	253030	7.86				
540-36-3	1,4-Difluorobenzene	452098	8.78				
3114-55-4	Chlorobenzene-d5	445535	11.58				
3855-82-1	1,4-Dichlorobenzene-d4	178748	13.52				

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TRIP-BLANK	SDG No.:	H5411
Lab Sample ID:	H5411-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOC-TCL
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN036793.D	1		10/27/16 16:34	VN102716

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16 09:30
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-13	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
CBOD5	95.2		1	2	2	2	mg/L		10/26/16 17:10	SM5210 B
Chloride	3840		1	0.4	2.5	5	mg/L		10/31/16 11:34	SM4500-CL C
Flash Point	>212		1	0	0	0	°F		10/31/16 15:42	1010A
Hexavalent Chromium	0.005	U	1	0.002	0.005	0.01	mg/L		10/26/16 09:02	SM3500-Cr-B
Nitrate+Nitrite	0.25	U	1	0.25	0.25	0.25	mg/L		10/26/16 16:13	300
Non-Polar Material	1.4	J	1	0.679	2.5	5	mg/L		10/31/16 11:30	1664A
pH	7.49	H	1	0	0	0	pH		10/26/16 16:41	SM 4500-PH B
Temperature	17.8	H	1	0	0	0	o C		10/26/16 16:41	
TKN	4.07		1	0.096	0.25	0.5	mg/L	10/27/16 13:00	10/31/16 13:55	SM4500-N Org B or C plus NH3 G
Total Nitrogen	4.07		1	0.75	0.75	0.75	mg/L		10/31/16 00:00	CAL
TS	7668		1	10	10	10	mg/L		10/26/16 08:15	SM2540B
TSS	199		1	4	4	4	mg/L		10/27/16 12:10	SM2540D

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-13	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	1.5	U	1	0.4	1.5	3	ug/L	10/28/16 09:00	10/28/16 15:44	EPA 200.7
7440-50-8	Copper	10.8		1	2.6	5.0	10	ug/L	10/28/16 09:00	10/28/16 15:44	EPA 200.7
7439-92-1	Lead	44.1		1	1.8	3.0	6	ug/L	10/28/16 09:00	10/28/16 15:44	EPA 200.7
7439-97-6	Mercury	0.345		1	0.034	0.1	0.2	ug/L	10/27/16 11:22	10/27/16 16:36	E245.1
7440-02-0	Nickel	5.58	J	1	3.7	10.0	20	ug/L	10/28/16 09:00	10/28/16 15:44	EPA 200.7
7440-66-6	Zinc	15	J	1	5.6	10.0	20	ug/L	10/28/16 09:00	10/28/16 15:44	EPA 200.7

Color Before:	Brown	Clarity Before:	Cloudy	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	NYCDischarge				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-13	Matrix:	Water
Analytical Method:	625	% Moisture:	100
Sample Wt/Vol:	980 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	NYCD-SVOC
Extraction Type :	Decanted : N	Level :	LOW
Injection Volume :	GPC Factor : 1.0	GPC Cleanup :	N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BG024529.D	1	10/27/16 11:38	10/27/16 20:13	PB94345

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
108-95-2	Phenol	2.1	J	0.47	1.3	2.6	ug/L
120-82-1	1,2,4-Trichlorobenzene	1.3	U	0.14	1.3	2.6	ug/L
91-20-3	Naphthalene	1.3	U	0.19	1.3	2.6	ug/L
SURROGATES							
367-12-4	2-Fluorophenol	38.7		10 - 160		39%	SPK: 100
13127-88-3	Phenol-d6	24.1		10 - 161		24%	SPK: 100
4165-60-0	Nitrobenzene-d5	100		25 - 124		101%	SPK: 100
321-60-8	2-Fluorobiphenyl	100		20 - 129		100%	SPK: 100
118-79-6	2,4,6-Tribromophenol	88.2		10 - 140		88%	SPK: 100
1718-51-0	Terphenyl-d14	93.1		14 - 155		93%	SPK: 100
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	116659	8.27				
1146-65-2	Naphthalene-d8	466974	11.1				
15067-26-2	Acenaphthene-d10	330283	14.88				
1517-22-2	Phenanthrene-d10	739009	17.63				
1719-03-5	Chrysene-d12	1006610	21.93				
1520-96-3	Perylene-d12	1082830	25.36				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-13	Matrix:	Water
Analytical Method:	E624	% Moisture:	100
Sample Wt/Vol:	5 Units: mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	NYCD-VOC
GC Column:	RTX-VMS ID : 0.18	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VH059344.D	1		10/28/16 21:44	VH102816

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
1634-04-4	Methyl tert-Butyl Ether	2.5	U	0.41	2.5	5	ug/L
56-23-5	Carbon Tetrachloride	2.5	U	0.57	2.5	5	ug/L
67-66-3	Chloroform	2.5	U	0.19	2.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	2.5	U	0.3	2.5	5	ug/L
71-43-2	Benzene	2.5	U	0.26	2.5	5	ug/L
108-88-3	Toluene	2.5	U	0.17	2.5	5	ug/L
127-18-4	Tetrachloroethene	2.5	U	0.86	2.5	5	ug/L
100-41-4	Ethyl Benzene	2.5	U	0.26	2.5	5	ug/L
1330-20-7	Total Xylenes	7.5	U	0.57	7.5	15	ug/L
106-46-7	1,4-Dichlorobenzene	2.5	U	0.22	2.5	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	2.5	U	0.38	2.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	29.5		50 - 169		98%	SPK: 30
2037-26-5	Toluene-d8	32.8		66 - 137		109%	SPK: 30
460-00-4	4-Bromofluorobenzene	30.3		56 - 143		101%	SPK: 30
INTERNAL STANDARDS							
74-97-5	Bromochloromethane	53856	3.67				
540-36-3	1,4-Difluorobenzene	289939	5.55				
3114-55-4	Chlorobenzene-d5	231151	9.7				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-13	Matrix:	Water
Analytical Method:	SW8082A	% Moisture:	100 Decanted:
Sample Wt/Vol:	990 Units: mL	Final Vol:	1000 uL
Soil Aliquot Vol:	uL	Test:	PCB
Extraction Type:		Injection Volume :	
GPC Factor :	1.0 PH :		

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
PO030817.D	1	10/27/16 11:35	11/01/16 17:03	PB94344

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
12674-11-2	Aroclor-1016	0.01	U	0.0097	0.0101	0.0505	ug/L
11104-28-2	Aroclor-1221	0.01	U	0.0101	0.0101	0.0505	ug/L
11141-16-5	Aroclor-1232	0.01	U	0.0101	0.0101	0.0505	ug/L
53469-21-9	Aroclor-1242	0.01	U	0.009	0.0101	0.0505	ug/L
12672-29-6	Aroclor-1248	0.01	U	0.0101	0.0101	0.0505	ug/L
11097-69-1	Aroclor-1254	0.01	U	0.0044	0.0101	0.0505	ug/L
37324-23-5	Aroclor-1262	0.01	U	0.0082	0.0101	0.0505	ug/L
11100-14-4	Aroclor-1268	0.01	U	0.0082	0.0101	0.0505	ug/L
11096-82-5	Aroclor-1260	0.01	U	0.0082	0.0101	0.0505	ug/L
SURROGATES							
877-09-8	Tetrachloro-m-xylene	19.4		35 - 137		97%	SPK: 20
2051-24-3	Decachlorobiphenyl	11.6		40 - 135		58%	SPK: 20

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
P = Indicates >25% difference for detected concentrations between the two GC columns
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
S = Indicates estimated value where valid five-point calibration was not performed prior to analyte detection in sample.
() = Laboratory InHouse Limit

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02	SDG No.:	H5411
Lab Sample ID:	H5411-14	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	88	N	1	6.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-36-0	Antimony	6.25	UN	1	6.25	6.25	25	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-38-2	Arsenic	87.2	N	1	2.5	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-39-3	Barium	254	N	1	4	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-41-7	Beryllium	0.75	UN	1	0.7	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-43-9	Cadmium	0.75	U	1	0.5	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-70-2	Calcium	194000		1	31.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-47-3	Chromium	2.63	J	1	1.1	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-48-4	Cobalt	3.75	U	1	3.75	3.75	15	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-50-8	Copper	3.75	J	1	2	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7439-89-6	Iron	1740	N	1	12.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7439-92-1	Lead	6.39		1	1.5	1.5	6	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7439-95-4	Magnesium	205000		1	32.5	250	1000	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7439-96-5	Manganese	374	N	1	1.7	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	10/27/16 15:54	10/28/16 12:04	SW7470A
7440-02-0	Nickel	4.41	J	1	4.2	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-09-7	Potassium	115000		1	38.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-22-4	Silver	1.25	U	1	1.25	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-23-5	Sodium	961000		1	13.9	250	1000	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-28-0	Thallium	5	U	1	2.4	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-62-2	Vanadium	5.02	J	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010
7440-66-6	Zinc	10.8	J	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:25	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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Report of Analysis

Client:	LiRo Engineers, Inc.	Date Collected:	10/25/16
Project:	DDC- Newtown Creek Nature Walk	Date Received:	10/25/16
Client Sample ID:	TWP-02-DUP	SDG No.:	H5411
Lab Sample ID:	H5411-15	Matrix:	WATER
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7429-90-5	Aluminum	90.3	N	1	6.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-36-0	Antimony	6.25	UN	1	6.25	6.25	25	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-38-2	Arsenic	82.8	N	1	2.5	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-39-3	Barium	246	N	1	4	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-41-7	Beryllium	0.75	UN	1	0.7	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-43-9	Cadmium	0.75	U	1	0.5	0.75	3	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-70-2	Calcium	187000		1	31.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-47-3	Chromium	7.28		1	1.1	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-48-4	Cobalt	3.75	U	1	3.75	3.75	15	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-50-8	Copper	4.02	J	1	2	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7439-89-6	Iron	1710	N	1	12.5	12.5	50	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7439-92-1	Lead	6.7		1	1.5	1.5	6	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7439-95-4	Magnesium	198000		1	32.5	250	1000	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7439-96-5	Manganese	343	N	1	1.7	2.5	10	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	10/27/16 15:54	10/28/16 12:06	SW7470A
7440-02-0	Nickel	6.5	J	1	4.2	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-09-7	Potassium	110000		1	38.8	250	1000	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7782-49-2	Selenium	5	U	1	4.8	5.0	10	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-22-4	Silver	1.25	U	1	1.25	1.25	5	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-23-5	Sodium	929000		1	13.9	250	1000	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-28-0	Thallium	5	U	1	2.4	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-62-2	Vanadium	5	U	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010
7440-66-6	Zinc	11.9	J	1	5	5.0	20	ug/L	10/27/16 09:00	10/27/16 14:29	SW6010

Color Before:	Colorless	Clarity Before:	Clear	Texture:	
Color After:	Colorless	Clarity After:	Clear	Artifacts:	
Comments:	DISSOLVED METALS-TAL				

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

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NEW YORK CITY LAW DEPARTMENT REQUEST FOR REVIEW OF PROPOSED CONTRACT

Form1

INITIAL COMPUTER ENTRY

A COMPLETED REQUEST FOR REVIEW FORM MUST ACCOMPANY EACH CONTRACT SUBMITTED TO THE LAW DEPARTMENT FOR APPROVAL AS TO FORM, INCLUDING RESUBMISSIONS, AMENDMENTS AND BID FORMS

TO: **David Varoli**
Department of Design and Construction
30-30 Thomson Avenue, Room 419
Long Island City, New York 11101

Agency Contact Person

Name: **Sarah Shelley-Zomick**
A+E Bid Package Review

Phone: **(718) 391- 1685**

FROM DIVISION:

I. FOR NON-BID SUBMISSIONS

Contractor Name: Type of Business:

Address: City: State: Zip:

Type of Request

☐ Standard Contract ☐ Std Class ☐ Grant ☐ Amend ☐ Franchise ☐ Under $25,000 ☐ Other (Specify)

II. FOR BID SUBMISSIONS

What is Contract for: (Overall Job, Purchase, Service, as on Contracts-Note Site)
Renovation of the Newtown Creek Nature Walk, Phase III

Contract No. & Title
#1 - General Construction

Procurement ID (PIN) No.: **8502018CT0002C**

CAPIS ID: **NC-61A**

Estimated $ Amount **$9,621,564**

If Off-Site, Job Location:
329 Greenpoint Aveune
Brooklyn, 11222

Contract Duration: **720 ccds**

III. FOR ALL SUBMISSIONS

If previous Submission, previous LAW DEPT Log #' ☐ Capital ☐ Non-Capital

Previous Action LAW DEPT. ☐ Rejection ☐ Revision of Previous Approval

Review Attorney: Other:
Agency Legal Office Phone No.:

TO BE FILLED IN BY LAW DEPARTMENT ONLY

Date Assigned	Date Out	Reviewing Attorney	Law Dept. Contract No.

THIS FORM MUST STAY WITH THE LAW DEPT. UPON SUBMISSION

PUBLIC BUILDINGS CONTRACT - LEGAL CHECKLIST

PIN Nos.: Contract #1 (GC) **8502018CT0002C**

Received in Legal: Legal Tracking No.:

Project Description / Location: **Renovation of the Newtown Creek Nature Walk, Phase III**
329 Greenpoint Aveune
Brooklyn, 11222

I CONTRACT COMPONENTS (other than Specifications)

I have reviewed the above described project and, unless otherwise specifically noted below, it contains the following contract components in their original form with no changes:

A. Bid Booklet (dated March 2017)
B. Project Labor Agreement
C. Information for Bidders (dated December 2013)
D. Contract (dated March 2017)
E. Schedule of Prevailing Wages (effective July 1, 2017 through June 30, 2018)
F. General Conditions (dated January 15, 2015)
G. Addendum to the General Conditions (dated March 1, 2017)

Exception to the above: (describe each exception; if none, so state)

Listing of Addenda or Additional Components:

Date:

Sarah Shelley-Zomick
A+E Bid Document Review

II SPECIFICATIONS (Completed by Project Managers)

I have reviewed the Specifications for all contracts contained in the above described project and certify as follows:

A. Special Experience Requirements: there are no special experience requirements set forth in the specifications other than those set forth on page 3-3a of the Bid Booklet.
B. Warranties and Guarantees: all requirements set forth in the specifications for the warranties from the manufacturer and/or guarantees by the contractor are consistent with industry standards for the applicable items.
C. Proprietary items: there are no requirements in the specifications for the provisions of proprietary items other than those listed on the Bid Form.
D. Insurance: there are no requirements in the specifications for the provision of insurance other than those listed on Schedule A of the Addendum to the General Conditions

Exception to the above: (describe: if none, so state)

Listing of Addenda or additional Components:

Date: Project Manager **Gregory Johnson**

FMS ID: **NC-61A**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/buildnyc

Department of Design and Construction

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

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Renovation of the Newtown Creek Nature Walk, Phase III

LOCATION: **329 Greenpoint Avenue**
BOROUGH: **Brooklyn, NY 11222**
CITY OF NEW YORK

Contractor

Dated _____ , 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20____