CONSTRUCTION CONTRACT

INVITATION FOR BIDS

New York City
Department of
Environmental Protection
59-17 Junction Boulevard
Flushing, New York 11373

Lisa F. Garcia
Commissioner

Joseph Vaicels
Assistant Commissioner,
Agency Chief Contracting Officer

Volume 2 of 2: Contract Terms, Specifications and Drawings

Contract: GI-CONS-7

Description: Installation of Green Infrastructure at Seven (7) NYC Parks and Playgrounds

AUGUST 2026

Rev. 2026-01

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Green Infrastructure Installation at Seven (7) NYC Parks and Playgrounds

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Notice To Bidders

Web-based access to BEDC EHS information

In conjunction with the requirements of Detailed Specification 01 35 27 – Environmental, Health and Safety (EHS) Requirements, DEP's Bureau of Engineering Design & Construction (BEDC) has provided the most recent version of DEP's EHS Policies and Procedures, BEDC EHS Standards, and other DEP EHS guidelines and additional information on the DEP Knowledge Reservoir of the BEDC web-based Project Management Information System (PMIS) at the following website: https://app.e-builder.net/public/publicLanding.aspx?QS=33fcd8611637450095d280fe48f856f1

For any question regarding the website, contact BEDC EHS at (718) 595-6228 or bedcehs@dep.nyc.gov.

Compliance with the latest versions of DEP EHS Policies and Procedures, BEDC EHS Standards, and DEP Guidelines are required on all DEP Contract work.

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Rev. 7/2020

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NOTICE TO NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION CONTRACTORS

Please be advised that all notices required to be submitted to the New York City Department of Environmental Protection ("DEP") Commissioner pursuant to Article 11, Article 27, Article 30, and Article 78[1] of the City of New York Standard Construction Contract must now instead be submitted electronically to the following email address: commcontractnotices@dep.nyc.gov.[2] Upon receipt, DEP will send an acknowledgement via email. The DEP Commissioner will no longer accept physical copies of said notices.

If a contractor is unable to comply with this notice, please contact commcontractnotices@dep.nyc.gov immediately to make alternative arrangements.

Please note the above email address may only accept messages that are ten megabytes or smaller. If your submission is larger than that, please contact commcontractnotices@dep.nyc.gov to request a link that will allow you to upload the documents.

Thank you for your anticipated cooperation.

[1]Please note that Article 78 appears only in the 2017 City of New York Standard Construction Contract.
[2]Please be advised that this notice only applies to documents that must be submitted to the DEP Commissioner. Please follow the contract and the Procurement Board Policy Rules when submitting documents to the Comptroller of the City of New York, the Contract Dispute Resolution Board, or any other entity.

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.

20.4.2 In the event that the amount otherwise due and owing to the **Contractor** by the **City** is insufficient to satisfy such demand, the **City** may, at its option, require payment from the **Contractor** of an amount sufficient to cover such demand and exercise any other right to require or recover payment which the **City** may have under **Law** or **Contract**.

20.4.3 In the event the **City** determines that the demand is invalid, any amount withheld pending the **City**'s review of such demand shall be paid to the **Contractor**; provided, however, no lien has been filed. In the event a claim or an action has been filed, the terms and conditions set forth in Article 23 shall apply. In the event a lien has been filed, the parties will be governed by the provisions of the Lien Law of the State of New York.

20.5 The provisions of this Article 20 shall not prevent the **City** and the **Contractor** from resolving disputes in accordance with the **PPB** Rules, where applicable.

20.6 In the event the **City** determines that the beneficiary is entitled to payment pursuant to this Article 20, such determination and any defenses and counterclaims raised by the **Contractor** shall be taken into account in evaluating the **Contractor's** performance.

20.7 Nothing in this Article 20 shall relieve the **Contractor** of the obligation to pay the claims of all persons with valid and lawful claims against the **Contractor** relating to the **Work**.

20.8 The **Contractor** shall not require any performance, payment or other bonds of any **Subcontractor** if this **Contract** does not require such bonds of the **Contractor**.

20.9 The payment guarantee made pursuant to this Article 20 shall be construed in a manner consistent with Section 137 of the State Finance Law and shall afford to persons furnishing labor or materials to the **Contractor** or its **Subcontractors** in the prosecution of the **Work** under this **Contract** all of the rights and remedies afforded to such persons by such section, including but not limited to, the right to commence an action against the **City** on the payment guarantee provided by this Article 20 within the one-year limitations period set forth in Section 137(4)(b).

ARTICLE 21. RETAINED PERCENTAGE

21.1 If this **Contract** requires one hundred (100%) percent performance and payment security, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and

retain until the substantial completion of the **Work**, five (5%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.2 If this **Contract** does not require one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded does not exceed one million ($1,000,000) dollars, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, five (5%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.3 If this **Contract** does not require one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded exceeds one million ($1,000,000) dollars, then as further security for the faithful performance of this **Contract,** the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, up to ten (10%) percent of the value of **Work** certified for payment in each partial payment voucher. The percentage to be retained is set forth in Schedule A of the General Conditions.

ARTICLE 22. INSURANCE

22.1 Types of Insurance: The **Contractor** shall procure and maintain the following types of insurance if, and as indicated, in Schedule A of the General Conditions (with the minimum limits and special conditions specified in Schedule A). Such insurance shall be maintained from the date the **Contractor** is required to provide Proof of Insurance pursuant to Article 22.3.1 through the date of completion of all required **Work** (including punch list work as certified in writing by the **Resident Engineer**), except for insurance required pursuant to Article 22.1.4, which may terminate upon **Substantial Completion** of the **Contract**. All insurance shall meet the requirements set forth in this Article 22. Wherever this Article requires that insurance coverage be "at least as broad" as a specified form (including all ISO forms), there is no obligation that the form itself be used, provided that the **Contractor** can demonstrate that the alternative form or endorsement contained in its policy provides coverage at least as broad as the specified form.

22.1.1 Commercial General Liability Insurance: The **Contractor** shall provide Commercial General Liability Insurance covering claims for property damage and/or bodily injury, including death, which may arise from any of the operations under this **Contract**. Coverage under this insurance shall be at least as broad as that provided by the latest edition of Insurance Services Office ("ISO") Form CG 0001. Such insurance shall be "occurrence" based rather than "claims-made" and include, without limitation, the following types of coverage: premises operations; products and completed operations; contractual liability (including the tort liability of another assumed in a contract); broad form property damage; independent contractors; explosion, collapse and underground (XCU); construction means and methods; and incidental malpractice. Such insurance shall contain a "per project" aggregate limit, as specified in Schedule A, that applies separately to operations under this **Contract**.

22.1.1(a) Such Commercial General Liability Insurance shall name the **City** as an Additional Insured. Coverage for the City shall specifically include the **City's** officials and employees, be at least as broad as the latest edition of ISO Form CG 20 10 and provide completed operations coverage at least as broad as the latest edition of ISO Form CG 20 37.

22.1.1(b) Such Commercial General Liability Insurance shall name all other entities designated as additional insureds in Schedule A but only for claims arising from the

Contractor's operations under this **Contract**, with coverage at least as broad as the latest edition of ISO Form CG 20 26.

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

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

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

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

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

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

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

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

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

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

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

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

22.1.7 Marine Insurance:

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

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

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

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

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

22.2 General Requirements for Insurance Coverage and Policies:

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

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

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

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

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

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

22.3 Proof of Insurance:

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

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

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

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

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

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

22.4 Operations of the **Contractor**:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

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

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

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

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

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

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

ARTICLE 24. MAINTENANCE AND GUARANTY

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

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

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

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

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

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

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

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

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

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

ARTICLE 25. CHANGES

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

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

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

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

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

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

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

ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

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

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

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

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

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

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

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

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

26.2.4 Reasonable rental value of **Contractor**-owned (or **Subcontractor**-owned, as applicable), necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour: (.035) 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.

2017 Standard Construction Contract Riders:

- NYC Earned Safe and Sick Time Act Contract Rider
- Rider to New York City Standard Construction Contract (March 2017) Regarding Non-Compensable Delays and Grounds for Extension
- Rider to New York City Standard Construction Contract (March 2017) Regarding Certified Payrolls
- New York City Mayoral Executive Order No. 39 Rider City Fleet and Truck Safety Requirements for City Contractors (version: November 19, 2024)
- Community Hiring Rider for Construction Contracts (version: February 20, 2025)

NYC EARNED SAFE AND SICK TIME ACT CONTRACT RIDER

(To supersede Section 4.06 of the November 2018 Appendix A and Section 35.5 of the March 2017 Standard Construction Contract and to be attached to other City contracts and solicitations)

A. *Introduction and General Provisions.*

1. The Earned Safe and Sick Time Act ("ESSTA"), codified at Title 20, Chapter 8 of the New York City Administrative Code, also known as the "Paid Safe and Sick Leave Law," requires covered employees (as defined in Admin. Code § 20-912) in New York City ("City") to be provided with paid safe and sick time. Contractors of the City or of other governmental entities may be required to provide safe and sick time pursuant to the ESSTA. The ESSTA is enforced by the City's Department of Consumer and Worker Protection ("DCWP"), which has promulgated 6 RCNY §§ 7-101 and 201 *et seq*. ("DCWP Rules").

2. The Contractor agrees to comply in all respects with the ESSTA and the DCWP Rules, and as amended, if applicable, in the performance of this agreement. The Contractor further acknowledges that such compliance is a material term of this agreement and that failure to comply with the ESSTA in performance of this agreement may result in its termination.

3. The Contractor must notify (with a copy to DCWP at ComplianceMonitoring@dcwp.nyc.gov) the Agency Chief Contracting Officer of the City Agency or other entity with whom it is contracting in writing within 10 days of receipt of a complaint (whether oral or written) or notice of investigation regarding the ESSTA involving the performance of this agreement. Additionally, the Contractor must cooperate with DCWP's guidance and must comply with DCWP's subpoenas, requests for information, and other document demands as set forth in the ESSTA and the DCWP Rules. More information is available at https://www1.nyc.gov/site/dca/about/paid-sick-leave-what-employers-need-to-know.page.

4. Upon conclusion of a DCWP investigation, Contractor will receive a findings letter detailing any employee relief and civil penalties owed. Pursuant to the findings, Contractor will have the opportunity to settle any violations and cure the breach of this agreement caused by failure to comply with the ESSTA either i) without a trial by entering into a consent order or ii) appearing before an impartial judge at the City's administrative tribunal. In addition to and notwithstanding any other rights and remedies available to the City, non-payment of relief and penalties owed pursuant to a consent order or final adjudication within 30 days of such consent order or final adjudication may result in the termination of this agreement without further opportunity to settle or cure the violations.

5. The ESSTA is briefly summarized below for the convenience of the Contractor. The Contractor is advised to review the ESSTA and the DCWP Rules in their entirety. The Contractor may go to www.nyc.gov/PaidSickLeave for resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the Contractor can get more information about how to comply with the ESSTA and the DCWP Rules. The Contractor acknowledges that it is responsible for compliance with the ESSTA and the DCWP Rules notwithstanding any inconsistent language contained herein.

B. *Pursuant to the ESSTA and DCWP Rules: Applicability, Accrual, and Use.*

1. An employee who works within the City must be provided paid safe and sick time.[1] Employers with one hundred or more employees are required to provide 56 hours of safe and sick time for an employee each calendar year. Employers with fewer than one hundred employees are required to provide 40 hours of sick leave each calendar year. Employers must provide a minimum of one hour of safe and sick time for every 30 hours worked by an employee and compensation for such safe and sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage at the time the paid safe or sick time is taken. Employers are not discouraged or prohibited from providing more generous safe and sick time policies than what the ESSTA requires.

2. Employees have the right to determine how much safe and sick time they will use, provided that an employer may set a reasonable minimum increment for the use of safe and sick time not to exceed four hours per day. For the use of safe time or sick time beyond the set minimum increment, an employer may set fixed periods of up to thirty minutes beyond the minimum increment. In addition, an employee may carry over up to 40 or 56 hours of unused safe and sick time to the following calendar year, provided that no employer is required to carry over unused paid safe and sick time if the employee is paid for such unused safe and sick time and the employer provides the employee with at least the legally required amount of paid safe and sick time for such employee for the immediately subsequent calendar year on the first day of such calendar year.

3. An employee entitled to safe and sick time pursuant to the ESSTA may use safe and sick time for any of the following:

a. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;

b. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild, or grandparent, the child or parent of an employee's spouse or domestic partner, any other individual related by blood to the employee, and any other individual whose close association with the employee is the equivalent of a family relationship) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;

[1] Pursuant to the ESSTA, if fewer than five employees work for the same employer, and the employer had a net income of less than one million dollars during the previous tax year, such employer has the option of providing such employees uncompensated safe and sick time.

c. closure of such employee's place of business by order of a public official due to a public health emergency;

d. such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency; or

e. when the employee or a family member has been the victim of a family offense matter, sexual offense, stalking, or human trafficking:

1. to obtain services from a domestic violence shelter, rape crisis center, or other shelter or services program for relief from a family offense matter, sexual offense, stalking, or human trafficking;
2. to participate in safety planning, temporarily or permanently relocate, or take other actions to increase the safety of the employee or employee's family members from future family offense matters, sexual offenses, stalking, or human trafficking;
3. to meet with a civil attorney or other social service provider to obtain information and advice on, and prepare for or participate in any criminal or civil proceeding, including but not limited to, matters related to a family offense matter, sexual offense, stalking, human trafficking, custody, visitation, matrimonial issues, orders of protection, immigration, housing, discrimination in employment, housing or consumer credit;
4. to file a complaint or domestic incident report with law enforcement;
5. to meet with a district attorney's office;
6. to enroll children in a new school; or
7. to take other actions necessary to maintain, improve, or restore the physical, psychological, or economic, health or safety of the employee or the employee's family member or to protect those who associate or work with the employee.

4. An employer must not require an employee, as a condition of taking safe and sick time, to search for a replacement. However, where the employee's need for safe and sick time is foreseeable, an employer may require an employee to provide reasonable notice of the need to use safe and sick time. For an absence of more than three consecutive work days, an employer may require reasonable documentation that the use of safe and sick time was needed for a reason listed in Admin. Code § 20-914; and/or written confirmation that an employee used safe and sick time pursuant to the ESSTA. However, an employer may not require documentation specifying the nature of a medical condition, require disclosure of the details of a medical condition, or require disclosure of the details of a family offense matter, sexual offense, stalking, or human trafficking, as a condition of providing safe and sick time. Health information and information concerning family offenses, sexual offenses, stalking or human trafficking obtained solely due to an

employee's use of safe and sick time pursuant to the ESSTA must be treated by the employer as confidential. An employer must reimburse an employee for all reasonable costs or expenses incurred in obtaining such documentation for the employer.

5. An employer must provide to all employees a written policy explaining its method of calculating sick time, policies regarding the use of safe and sick time (including any permissible discretionary conditions on use), and policies regarding carry-over of unused time at the end of the year, among other topics. It must provide the policy to employees using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny safe and sick time to an employee because of non-compliance with such a policy.

6. An employer must provide a pay statement or other form of written documentation that informs the employee of the amount of safe/sick time accrued and used during the relevant pay period and the total balance of the employee's accrued safe/sick time available for use.

7. Safe and sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the safe and sick time was used.

C. *Exemptions and Exceptions*. Notwithstanding the above, the ESSTA does not apply to any of the following:

1. an independent contractor who does not meet the definition of employee under N.Y. Labor Law § 190(2);

2. an employee covered by a valid collective bargaining agreement, if the provisions of the ESSTA are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the ESSTA for such employee;

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

4. an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

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

6. a participant in a Work Experience Program (WEP) under N.Y. Social Services Law § 336-c.

D. *Retaliation Prohibited.* An employer shall not take any adverse action against an employee that penalizes the employee for, or is reasonably likely to deter the employee from or interfere with the employee exercising or attempting in good faith to exercise any right provided by the ESSTA. In addition, an employer shall not interfere with any investigation, proceeding, or hearing pursuant to the ESSTA.

E. *Notice of Rights.*

1. An employer must provide its employees with written notice of their rights pursuant to the ESSTA. Such notice must be in English and the primary language spoken by an employee, provided that DCWP has made available a translation into such language. Downloadable notices are available on DCWP's website at https://www1.nyc.gov/site/dca/about/Paid-Safe-Sick-Leave-Notice-of-Employee-Rights.page. The notice must be provided to the employees by a method that reasonably ensures personal receipt by the employee.

2. Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed $50.00 for each employee who was not given appropriate notice.

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

G. *Enforcement and Penalties.*

1. Upon receiving a complaint alleging a violation of the ESSTA, DCWP must investigate such complaint. DCWP may also open an investigation to determine compliance with the ESSTA on its own initiative. Upon notification of a complaint or an investigation by DCWP, the employer must provide DCWP with a written response and any such other information as DCWP may request. If DCWP believes that a violation of the ESSTA has occurred, it has the right to issue a notice of violation to the employer .

2. DCWP has the power to grant an employee or former employee all appropriate relief as set forth in Admin. Code § 20-924(d). Such relief may include, but is not limited to, treble damages for the wages that should have been paid; statutory damages for unlawful retaliation; and damages, including statutory damages, full compensation for wages and benefits lost, and reinstatement, for unlawful discharge. In addition, DCWP may impose on an employer found to have violated the ESSTA civil penalties not to exceed $500.00 for a first violation, $750.00 for a second violation within two years of the first violation, and $1,000.00 for each succeeding violation within two years of the previous violation. When an employer has a policy or practice of not providing or refusing to allow the use of safe and sick time to its employees, DCWP may seek penalties and relief on a per employee basis.

3. Pursuant to Admin. Code § 20-924.2, (a) where reasonable cause exists to believe that an employer is engaged in a pattern or practice of violations of the ESSTA, the Corporation Counsel may commence a civil action on behalf of the City in a court of competent jurisdiction by filing a complaint setting forth facts relating to such pattern or practice and requesting relief, which may include injunctive relief, civil penalties and any other appropriate relief. Nothing in § 20-924.2 prohibits DCWP from exercising its authority under section 20-924 or the Charter, provided that a civil action pursuant to § 20-924.2 shall not have previously been commenced.

H. *More Generous Polices and Other Legal Requirements.* Nothing in the ESSTA is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous safe and sick time policy, or the obligation of an employer to comply with any contract, collective bargaining agreement, employment benefit plan or other agreement providing more generous safe and sick time. The ESSTA provides minimum requirements pertaining to safe and sick time and does not preempt, limit, or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of safe and sick leave or time, whether paid or unpaid, or that extends other protections to employees. The ESSTA may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

RIDER TO NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (MARCH 2017) REGARDING NON-COMPENSABLE DELAYS AND GROUNDS FOR EXTENSION

[Instructions to Agencies: Please attach this Rider to the March 2017 version of the New York City Standard Construction Contract]

The following provisions supersede the corresponding provisions in the March 2017 version of the New York City Standard Construction Contract:

1. Section **11.5.1** provides as follows:

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

2. Section **11.5.6** provides as follows:

   11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God; acts of war or of the public enemy or terrorist acts; disruption, outage or power failure caused by a utility's inability or failure to provide service, pandemics, epidemics, outbreaks of infectious disease or any other public health emergency; other states of emergency declared by the City, State or Federal government , quarantine restrictions, and freight embargoes; including the **City's** reasonable responses to any of the above; and

3. Section **13.3** provides as follows:

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

   13.3.1 By any of the acts or omissions of the **City**, its officials, agents or employees set forth in Articles **11.4.1.1** through **11.4.1.9**; or

   13.3.2 By or attributable to any of the items set forth in Articles **11.5.1** through **11.5.7**.

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

RIDER TO NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (MARCH 2017) REGARDING CERTIFIED PAYROLLS

[Instructions to Agencies: Please attach this Rider to the March 2017 version of the New York City Standard Construction Contract]

The following provisions supersede the corresponding provisions in the March 2017 version of the New York City Standard Construction Contract. Article 38 provides as follows:

ARTICLE 38. PAYROLL REPORTS

38.1 The **Contractor** and its **Subcontractor(s)** shall maintain 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), as modified by Labor Law Section 220-j. The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts into the Electronic Certified Payroll Database (as hereinafter defined). If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both at the same time payment requisitions are submitted and independently of its payment requisitions. For purposes of this Article 38, "Electronic Certified Payroll Record Database" means the City's publicly accessible online database of electronic certified payroll records through which contractors and subcontractors submit certified payroll reports in an electronic format. The database is accessible at the following link: https://nyc-oti.ecomply.us/

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.

New York City Mayoral Executive Order No. 39 Rider

City Fleet and Truck Safety Requirements for City Contractors

Version: 11/19/24

[Instruction to Agencies: Please attach this Rider to the following agreements: (1) Procurement Contracts that meet the criteria set forth in Executive Order 39 of February 1, 2024; and (2) to the March 2017 version of the New York City Standard Construction Contract.]

Section 1.01 Background

This rider is included in the Agreement and made a part thereof pursuant to the provisions of Mayoral Executive Order 39 of 2024.

Section 1.02 Definitions

A. Capitalized terms not otherwise defined in this rider shall have the meaning ascribed to them in the Agreement.

B. Agreement: The agreement between the City and the Contractor, to which this rider has been added and made a part.

C. City-contracted Vehicle means a Truck (as hereinafter defined) or any other motor vehicle that the Contractor anticipates providing in accordance with this Agreement or using in performing its obligations under this Agreement on a weekly or more frequent basis[1]. This includes those vehicles anticipated to be provided or used by subcontractors to fulfill the scope of a subcontract for work to be performed under a contract that is subject to the Executive Order, regardless of monetary value of the subcontract, if the vehicle is utilized on a weekly or more frequent basis.

D. Contracting Agency: the City agency or office through which the City of New York has entered into this Agreement.

[1] The following vehicles are not considered City-contracted vehicles and are thus not subject to Executive Order 39: any motor vehicle or truck that is utilized pursuant to (1) contracts registered prior to July 1, 2024, including the renewal, extension, or modification of such contracts; (2) an agency on-call emergency contract; (3) an emergency procurement made pursuant to section 3-06 of title 9 of the Rules of the City of New York or pursuant to an executive order of the Mayor or Governor issued under section 24 or section 29-A of the New York State Executive Law; (4) intergovernmental contracts; (5) government-to-government contracts between the City and any State or Federal government agency; and (6) a contract for utilities, as identified in subdivision (b) of section 825 of the New York City Charter.

E. Contractor: the entity providing services under this Agreement.

F. Executive Order: Mayoral Executive Order 39 of 2024, as it may be amended.

G. High Vision Truck: A Truck with a cab-over or cab-forward design wherein the driver sits in front of the front axle as opposed to conventional cab design wherein the engine and front axle are in front of the driver. The distance from the forward of the center of the vehicle bumper at which the driver can see the top of a 3-foot cone shall not exceed eight feet and the distance beyond the exterior of the passenger side door at which the driver can first see the top of the 4-foot cone shall not exceed six feet.

H. Registration: Registration of this Agreement pursuant to Section 328 of the New York City Charter.

I. Telematics: Automatic vehicle location systems that track vehicle location and speed and alert the driver and another designated person(s) to such location and speed in real time.

J. Truck: A City-contracted Vehicle with a manufacturer's gross vehicle weight rating exceeding 10,000 pounds. The term does not include off-road construction vehicles.

K. Truck Surround Cameras: A system of cameras, sensors, and alerts placed on a Truck that provides a Truck operator with a full view of all four sides of the Truck.

L. Vehicle Safety Plan: A plan with regard to City-contracted Vehicles, approved by the Contracting Agency, that includes the components listed in Section 2.03(A) through (F) of this rider.

Section 2.01 Vehicle Requirements

All City-contracted Vehicles shall conform to the following requirements:

A. Truck Surround Cameras: All Trucks, other than High Vision Trucks, shall be outfitted with truck surround cameras in accordance with the following schedule:
   a. Contracts involving 10 or fewer Trucks: No later than 12 months from Registration.
   b. Contracts involving more than 10 Trucks: No later than 18 months from Registration.
   c. New or replacement Truck acquired after work under this Agreement has begun: Truck must be outfitted with Truck Surround Cameras within 12 months from the date of first using such Truck.
   d. Contractor must submit to the Contracting Agency photographic and purchase order evidence, that is satisfactory to the Contracting Agency, of compliance with this Paragraph (A).

B. Truck Side-guards: Contractor shall provide side-guards for City-contracted Vehicles as applicable pursuant to Section 6-141 of the New York City Administrative Code.

C. Telematics: All City-contracted Vehicles must be installed with Telematics. Data gathered by Telematics must be made available in a manner that is satisfactory to the Contracting Agency.

Section 2.02 Safety Requirements

Contractor shall provide the following:

A. Licensing: Contractors shall ensure proper licensing for all drivers who operate City-contracted Vehicles. Contractors shall ensure that all drivers operating City-contracted Vehicles are enrolled in the New York State License Notification System (LENS) and that all out-of-state licenses are being monitored by Contractor. Contractor must notify the Contracting Agency of any license suspensions and/or arrests tied to unsafe or illegal vehicle operation by any drivers of City-contracted Vehicles.

B. Training: Contractor must provide the Contracting Agency documentation, satisfactory to the Contracting Agency, showing:
    a. That all drivers of City-contracted Vehicles have taken a New York State approved defensive driving class within six months after Registration; or
    b. That all drivers of City-contracted Vehicles have attended a New York State-approved defensive driving class within 3 years prior to Registration; or
    c. That all drivers of City-contracted Vehicles have received alternative safe driver training acceptable to the Contracting Agency that is documented to the satisfaction of the Contracting agency.

C. Crash tracking: Contractors must notify the Contracting Agency of any and all collisions that take place involving City-contracted Vehicles while performing services under this Agreement.

Section 2.03 Vehicle Safety Plan

Within one month after Registration, the Contractor must submit, for review and approval, to Contracting Agency, at the address set forth in the Agreement for notices to the City, and DCAS Fleet (C/O Chief Fleet Management Officer, 23rd Floor South, Municipal Building, 1 Centre Street, NY, NY 10007) a proposed vehicle safety plan that shall include at the minimum the components listed in Paragraphs (A) through (E) below. If directed by the Contracting Agency,

Contractor shall revise said proposed vehicle safety plan in accordance with the directions of the Contracting Agency, and until the Contracting Agency issues its approval thereof, Contractor shall submit a revised proposed vehicle safety plan to the Contracting Agency in each case, within 15 days after receipt by Contractor of directions to that effect from the Contracting Agency. Upon approval of the proposed vehicle safety plan, said proposed plan shall be considered the Vehicle Safety Plan and Contractor shall comply with the terms thereof. Each second anniversary of the approval of the Vehicle Safety Plan the Contractor shall submit an update thereof. The Vehicle Safety Plan shall include at the minimum the following components:

A. Vehicle List: List of City-contracted Vehicles, including the year, make, model, VIN and license plate number of each City-contracted Vehicle;

B. Safety Training: Documentation showing that all drivers of City-contracted Vehicles have completed the training detailed in section 2.02(B) of this Rider;

C. Technology: A list of all relevant technology investments installed on City-contracted vehicles, including but not limited to the technology listed in section 2.01 of this Rider;

D. Crash Tracking: An explanation of Contractor's process of monitoring and reviewing collisions including plans to notify Contracting Agency of collisions that take place while performing services under this Agreement;

E. Corrective Action: A corrective action program for drivers of City-contracted Vehicles that engage in unsafe or dangerous driving behaviors and license monitoring; and

F. Additional Safety Measures: Contractor must indicate if there are any additional safety technologies, safety practices, training, or other procedures that are utilized for City-contracted Vehicles during the term of this Agreement.

Section 3.01 Liquidated Damages

A. Contractor acknowledges that its failure to comply with the provisions of this Vehicle Safety Plan will cause loss and damage to the City, the precise extent of which is difficult to ascertain in monetary terms. For this reason, the parties desire to provide fair and reasonable compensation to the City for such losses, which compensation shall not be construed as a penalty. It is therefore agreed that, in addition to any other liquidated damages that the Contractor shall be required to pay to the City in accordance with the provisions of the Agreement, Contractor shall pay to the City the following:
    a. The sum of $500.00 for each instance of a failure by the Contractor to submit a Vehicle Safety Plan in accordance with the provisions of Section 2.03.

b. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(A) [Licensing].
c. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(B) [Training].
d. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(C) [Crash Tracking].
e. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(C) [Telematics].
f. The sum of $3,000 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(A).
g. The Contracting Agency will provide at least 5 working days of notice to the Contractor and opportunity to rectify before implementing these liquidated damages.

B. Liquidated damages received pursuant to this Agreement are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the City's right to indemnification, or the Contractor's obligation to indemnify the City, or to any other remedy provided for in this Agreement or by Law. The City may deduct and retain out of the monies which may become due under this Agreement, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

Community Hiring Rider

For Construction Contracts

Version: February 20, 2025

Program Description

Community Hiring, as authorized under Chapter 79 of the New York City Charter ("Charter"), is an initiative to set workforce goals on City procurement for contractors to employ low-income individuals and residents of economically disadvantaged communities.

The provisions set forth in this Rider shall apply to contracts with a total value exceeding three million dollars, unless otherwise exempt under the rules set forth under the Community Hiring Rules, adopted as Title 74 of the Rules of the City of New York (RCNY). Under 74 RCNY § 1-03(b), the following contracts are exempt: preferred source contracts; contracts for the performance of services by a city-affiliated not-for-profit corporation, goods contracts; contracts in an amount below the small purchase threshold; contracts for investigative or confidential services; contracts subject to federal or state funding requirements that preclude or substantially conflict with the application of Community Hiring Goals; contracts awarded through the United States General Services administration, or through the New York State Office of General Services; contracts for emergency demolition services procured by the Department of Housing Preservation and Development; contracts for which contractor selection is made by an elected official other than the Mayor or an agency other than a Mayoral Agency; contracts subject to 9 RCNY § 1-02(f); contracts designated for inclusion in a mentoring program as defined in Section 1206 or 1309 of the Charter; and contracts for banking services, electronic payment services, or other related services procured by the New York City Department of Finance.

The Community Hiring Rules are hereby incorporated in this Contract by reference and all terms used herein shall have the meanings given such terms in the Community Hiring Rules. In the event of any conflict between the Community Hiring Rules and this Rider, the rules shall control. As of the execution of this Contract, the Contactor represents that it has read, in its entirety, and agrees to comply with the Community Hiring Rules.

The Community Hiring program supersedes the HireNYC initiatives and the related riders, including, but not limited to references to the Public Assistance Commitment Rider and the HireNYC Hiring and Employment Rider. Article 35.6 of this Contract is amended and replaced with the Community Hiring Rules.

Community Hiring Requirements

The Contractor agrees to comply with the requirements of the Community Hiring Rules in the performance of this Contract.

A. Community Hiring Goal

Pursuant to 74 RCNY § 4-02(b), the Contractor shall make best efforts to meet the applicable Community Hiring Goal to employ Residence-Based Community Hires as defined in 74 RCNY § 2-01(a) for contracts involving construction work.

For each Contract involving Construction Work that is not subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the Community Hiring Goal of 30 percent of cumulative labor hours of construction work to be performed by Residence-Based Community Hires as established in 74 RCNY § 4-02(b)(1). For contracts involving Construction Work that are subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the numerical goal(s) regarding Residence-Based Community Hires and Apprentices established in such Project Labor Agreement.

In accordance with 74 RCNY § 5-01(b), the Contractor shall require its subcontractors, as defined under 74 RCNY § 1-02, to make best efforts to meet the applicable Community Hiring Goal.

B. Advertising Employment Opportunities

The Contractor, except those performing Construction Work pursuant to a Project Labor Agreement, agrees to advertise the Employment Opportunities, as defined in 74 RCNY § 1-02, in conspicuous places available to the public and in a manner reasonable for the industry.

For purposes of meeting a Community Hiring Goal, the Contractor shall notify a Referral Source, as provided in accordance with 74 RCNY § 3-02(a), of the job opportunities to be filled by Community Hires. The Contractor shall provide notice to the Office of Community Hiring and Workforce Development (OCH) when the Referral Source has impeded the Contractor's efforts to meet the Community Hiring Goal.

C. System Enrollment and Reporting

The Contractor shall enroll with an electronic system designated by the Director of OCH in accordance with 74 RCNY § 5-01(e).

Once enrolled into the system, the Contractor shall be responsible for updating the information in the system in a reasonable and timely manner.

The Contractor may fulfill the advertising requirement set forth in 74 RCNY § 5-01(c) by posting in such system all the relevant information of an Employment Opportunity to be filled by Community Hires. The Contractor shall also provide, upon request by the City with reasonable notice, any information related to the Contractor's compliance with or progress towards meeting the Community Hiring Goal.

Records

A. Retention

The Contractor shall maintain records in accordance with the applicable requirements set forth in 74 RCNY §§ 6-01 and 6-02.

For purposes of 74 RCNY § 6-01(b), the Contractor shall designate a representative to monitor all activity related to compliance to ensure that the Contractor is exercising best efforts to meet the Community Hiring Goal and maintain records to submit the documentation relating to the provisions herein.

B. Access to Records

The Contractor shall furnish, and require its subcontractors to furnish, all information and reports in accordance with the laws, rules, regulations or guidance from the City.

Compliance

Without limitation to any other provisions under this Contract and any other remedies available to the City, a failure to comply with the requirements under the Community Hiring Rules is a non-compliance that may be subject to civil penalties pursuant to Chapter 7 of the Community Hiring Rules and may be considered as a factor in evaluating contract performance in accordance with 9 RCNY § 4-01.

A. Best Efforts

Where the Contractor has failed to meet the Community Hiring Goal, the Contractor shall demonstrate that it exercised best efforts to meet the goal. Where determined, as set forth in 74 RCNY § 5-03, that the Contractor failed to make best efforts, the City shall send written notice to the Contractor's designated representative, notwithstanding the notice provisions in the Contract. The Contractor shall respond in accordance with the instructions in the notice. Failure to timely respond can result in a non-compliance determination subject to civil penalties as set forth in 74 RCNY § 7-01.

B. Corrective Action

Where the City determines that the non-compliance may be remedied through a corrective action and provides notice to the Contractor pursuant to 74 RCNY § 7-02(a)(2), the Contractor shall respond in accordance with the requirements outlined in the notice. The Contractor is responsible for timely demonstration of taking the requisite corrective action. Demonstration of corrective action to the satisfaction of the Director of OCH, may result in waiving of the civil penalties[1] as set forth in the Community Hiring Rules.

[1] Only civil penalties relating to non-compliance with the Community Hiring Rules can be waived in this instance.

C. Civil Penalties

Where Contractor is found non-compliant subject to civil penalties, the City can impose a civil penalty amount in accordance with the schedule set forth in 74 RCNY § 7-03.

The City may withhold from the Contractor the amount of the civil penalties upon final determination as set forth in 74 RCNY § 7-01(d).

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SIGNATURE OF THE CONTRACT

IN WITNESS WHEREOF, the Commissioner, on behalf of the City of New York and the Contractor, have executed **FIVE COPIES of this contract, three parts of which are to remain with the Commissioner, one other to be filed with the Comptroller of the City, and the fifth to be delivered to the Contractor.**

THE CITY OF NEW YORK

BY_____
COMMISSIONER

_____
NAME OF CONTRACTOR

BY_____
AUTHORIZED OFFICER OF THE FIRM OR CORPORATION

(Where Contractor is a Corporation, add):
Attest:

_____(Seal)
SECRETARY

ACKNOWLEDGMENT BY CORPORATION

State of_____, County of_____ ss:

On this_____ day of _____, _____

before me personally came_____

who affirms or being by me duly sworn, did depose and say that he/she resides in

the City of_____; that he/she is the_____

of the _____the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation, that the seal affixed to the said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation; and that he/she signed his name thereto by like order.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT BY COMMISSIONER

State of New York, County of Queens ss:

On this_____ day of_____,_____

before me personally came_____

to me known and known to me to be the_____ Commissioner of the Department Environmental Protection of the City of New York, the person described as such in and who as such executed the foregoing instrument and he/she acknowledged to me that he/she executed the same as Commissioner for the purposes therein mentioned.

_____
Notary Public or Commissioner of Deeds

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ACKNOWLEDGMENT BY PARTNERSHIP

State of_____, County of_____ ss:

On this_____ day of _____, _____

before me personally came _____,to be known

and known to me to be a member of_____, the firm described in and which executed the foregoing instrument and he/she acknowledged to me that he/she subscribed the name of said firm thereto on behalf of said firm for the purposes therein mentioned.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT BY INDIVIDUAL

State of _____, County of _____ ss:

On this_____ day of_____,_____

before me personally came_____

to me known and known to me to be the same person described and who executed the foregoing instrument and he/she acknowledged to me that he/she executed the same for the purposes therein mentioned

_____
Notary Public or Commissioner of Deeds

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AUTHORITY

MAYOR'S CERTIFICATE NO. CBX _____ DATED_____

BUDGET DIRECTOR'S CERTIFICATE NO. CP/CAS_____ 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:

_____

$_____

is chargeable to the fund of the Department of Environmental Protection Budget Code(s):

_____

_____

I hereby certify that the specifications contained herein comply with the terms and conditions of the FY_____ BUDGET.

_____

Commissioner of the Department of Environmental Protection

COMPTROLLER'S CERTIFICATE

The City of New York_____,_____

In pursuance of 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

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PERFORMANCE BOND

KNOW ALL PEOPLE BY THESE PRESENTS:,
That we,_____

hereinafter referred to as the "Principal,"
and,_____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum of_____

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

WHEREAS, The Principal is about to enter, or has entered, into a Contract in writing with the City for

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making

good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereof from the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or to the said Contract or the Work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

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 _____.

Performance Bond Greater Than $5 Million

_____.

(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.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____; that he/she is the_____
of ___the corporation described in and which executed the foregoing instrument; and that he signed his name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____; that he/she is _____ partner of _____, a limited/general partnership existing under the laws of the State of _____, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds.

Affix Acknowledgments and justification of Sureties

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PERFORMANCE BOND

KNOW ALL PEOPLE 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

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.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____; that he/she is the_____
of ___the corporation described in and which executed the foregoing instrument; and that he signed his name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____; that he/she is _____ partner of _____, a limited/general partnership existing under the laws of the State of _____, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of _____County of _____ ss:

On this__day of _____ 20 _____before me personally came_____
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds.

Affix Acknowledgments and justification of Sureties

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PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we,

_____

_____

_____

hereinafter referred to as the "Principal" and

_____

_____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of:

_____

$_____ .

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.

PAYMENT BOND

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 of any such Subcontractors, including all persons so engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any Contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the Project, and

b) Materials and supplies (whether incorporated in the permanent (construction or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any Subcontractors 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 null and void; otherwise to remain in full force and effect. This bond is subject to the following additional conditions, limitations and agreements:

c) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialman or laborer having a just claim, as well as the City itself.

d) 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 person as party plaintiff.

e) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs or otherwise, obtained against either or both of them by 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.

f) 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.

PAYMENT BOND

g) 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/herself 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, MATERIALMAN and third persons, for work, labor, services, supplies or material performed, rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be placed in this bond.

And the Surety (Sureties) for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond 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 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.

PAYMENT BOND

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this_____day of_____,_____.

(SEAL) _____(L.S.)
Principal
By: _____

(SEAL) _____
Surety

By: _____

(SEAL) _____
Surety

By: _____

(SEAL) _____
Surety

By: _____

(SEAL) _____
Surety

By: _____

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 member of counterparts of the bond corresponding to the number of counterparts of the Contract.

PAYMENT BOND

ACKNOWLEDGMENT OF PRINCIPAL - IF A CORPORATION

State of_____County of _____ss:

On this _____ day of _____, _____

before me personally came _____

to me known, who, affirms or 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; that he/she knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he/she signed his name thereto by like order.

_____
Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL - IF A PARTNERSHIP

State of_____ County of _____ss.:

On this _____day of _____,_____

before me personally appeared _____

to me known and known to me to be one of the members of the firm

of: _____
described in and who executed the foregoing instrument and he/she acknowledged to me that he/she executed the same as and for the act and deed of said firm.

_____
Notary Public or Commissioner of Deeds

PAYMENT BOND

ACKNOWLEDGMENT OF PRINCIPAL - IF AN INDIVIDUAL

State of_____ County of _____SS.:

On this _____ day of _____ , _____

before me personally appeared _____ me known and known to me to be the

person described in and who executed the foregoing instrument and acknowledged that he/she 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) duly certified copy of latest published financial statement of assets and liabilities of Surety.

****

AFFIX ACKNOWLEDGMENTS AND JUSTIFICATIONS OF SURETIES

GENERAL CONDITIONS
and SCHEDULE A

GENERAL CONDITIONS

ARTICLE 1 - SCOPE AND INTENT

Work Described. The Contractor shall furnish all labor, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies and other means of construction necessary or proper for performing and completing the Work in accordance with the Contract. The Contractor shall also obtain and pay for all required permits to complete the Work. Any labor, materials and equipment that have been omitted in the description of the Work, but that are necessary or proper for the completion of the Work, shall be furnished by the Contractor at its sole cost and expense. The Contractor shall protect the Work during construction, clean up the Site and maintain the Work until Final Acceptance.

Incidental work. The Contractor shall perform all tasks and pay all costs of cutting, protecting, supporting, maintaining, relocating and restoring all surface, sub-surface, and/or overhead structures, and all other property, including, but not limited to, pipes, conduits, ducts, tubes, chambers, and appurtenances, public or private, in the vicinity of and at the Site of the Work (except that which by law, franchise, permit, contract, consent or other agreement, the owner thereof is required to protect, support, maintain, relocate or restore), repair the same if damaged and restore to their original condition all areas disturbed. The Contractor shall perform all tasks and pay all costs of protecting, supporting, maintaining, relocating, replacing and restoring street equipment owned by the City and under the jurisdiction of the New York City Department of Transportation ("NYCDOT"), whether attached to utility company structures or connected to the underground electrical distribution system, including installing suitable temporary lighting equipment when the maintenance of permanent equipment is not feasible. All work done in connection with street lighting shall be in accordance with the requirements of NYCDOT or, for projects outside the City of New York, a local Authority Having Jurisdiction ("AHJ") over such work.

Duties of the Contractor. The Contractor shall ensure that the requirements of the Contract, including but not limited to, the Contract Drawings and Specifications, are fully and faithfully complied with by all subcontractors, materialmen and workmen at all times, that all of this Work is prosecuted with the utmost diligence, and that all materials are provided promptly in sufficient quantities in order not to delay the Work. The Contractor shall exercise the closest inspection of all materials delivered, promptly returning defective materials without waiting for their rejection by the Engineer. The Contractor shall also become thoroughly familiar with the Contract Drawings and Specifications and shall promptly report to the Engineer all errors, discrepancies or omissions discovered therein. The Contractor shall abide by the decisions and explanations of the Engineer made in regard to such matters.

Contractor Assumes Risk of Loss or Damage. The Contractor agrees to assume the risk and to make no claim on account of any and all loss or damage arising out of the nature of the Work to be done under this Contract, or for any unforeseen obstructions or difficulties which may be encountered in the prosecution of the same, or from the effect of the elements, or from encumbrances on or near the line of the Work.

Local Laws. All materials, appliances and types or methods of construction shall be in accordance with the Contract and shall in no event be less than that necessary to conform to the requirements of the New York City Administrative Code, the Charter of the City of

New York (the "City Charter"), the Rules of the City of New York, and/or the applicable laws and rules of AHJs if the Work occurs outside the City of New York.

Ample quantities. The Contractor shall deliver materials in ample quantities to ensure speedy and uninterrupted progress of the Work in order to complete the Work within the Contract term.

Work and materials. All Work and materials mentioned in the Specifications and not shown on the Contract Drawings, and all Work and materials shown on the Contract Drawings and not mentioned in the Specifications, are to be furnished and performed as if the same were both mentioned in the Specifications and shown on the Contract Drawings.

Necessary and essential Work deemed included. In case any Work or materials shall be required for the more perfect performance of the Work, which are not specifically mentioned, specified or indicated on the Contract Drawings, in the Specifications, or other parts of this Contract, and which in the opinion of the Engineer are necessary and essential to a complete performance of this Contract, such Work or materials shall be deemed included within the requirements of this Contract. The Contractor hereby specifically promises, covenants and agrees to do and perform any and all such Work and to supply any and all such materials as if specifically provided for in this Contract.

Purport of schedules. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind and quality of materials and equipment included in Work to be performed under this Contract.

Order of Precedence. In the event of an actual conflict among the City of New York Standard Construction Contract, General Conditions, and the Contract Drawings and Specifications, the City of New York Standard Construction Contract will control, followed by the General Conditions, followed by the Contract Drawings and Specifications.

Conflicts between Contract Drawings and Specifications. If the Contract Drawings and/or the Specifications are in conflict, or, if the Contract Drawings or the Specifications, or both the Contract Drawings and the Specifications are not clear as to (a) the method of performing any part of the Work; (b) the types of materials or equipment necessary to perform the Work; or (c) the quantities required, the Contractor shall be deemed to have based its bid upon performing the Work and furnishing materials or equipment in the manner most expensive to the Contractor. If DEP determines that such conflict(s) exist or that a clarification is needed, the DEP will furnish the Contractor with supplementary drawings and/or specifications to address such conflict(s) or necessary clarification. In such event, the Contractor agrees to execute the Work in accordance with such interpretation, and to make no charge or claim for any extra or additional work or damage on account of such interpretation.

Understanding of the Contract Drawings and Specifications. The Contractor expressly declares and acknowledges that, before the signing of this Contract, it has carefully read the entire Contract, together and in connection with the Contract Drawings and Specifications, and that through such reading, the Contractor can determine the Work required pursuant to this Contract. The Contractor agrees that it will not hereafter make any claim or demand upon the City based upon or arising out of any alleged

misunderstanding or misconception of the said requirements, covenants, stipulations and restrictions of the Contract.

Deviations from Contract Drawings and Specifications. No deviation from the Contract Drawings and Specifications will be allowed, unless the same has been previously authorized in writing by the Commissioner or his/her designee.

ARTICLE 2 - PROVISIONS REFERENCED WITH INFORMATION FOR BIDDERS AND THE CITY OF NEW YORK STANDARD CONSTRUCTION CONTRACT

(A) SCHEDULE "A" AND LIQUIDATED DAMAGES

1. Schedule “A” requirements for the Contract follow these General Conditions.

2. In view of the difficulty of accurately ascertaining the loss(es) which the City will suffer because of the Contractor exceeding substantial completion time for the Work, or failing to complete a designated milestone within the scheduled time for completion of such milestone, or failing to meet other requirements for which liquidated damages have been provided, the amounts set forth in Schedule A are hereby fixed and agreed to as liquidated damages that the City will suffer by reason of any such failure, and not as a penalty. The City of New York Standard Construction Contract, incorporated herein, shall govern with respect to assessment of all liquidated damages provided for in this Contract, not just those for failure to timely achieve substantial completion, unless specifically detailed in a Specification where any individual liquidated damages are specified.

(B) FEDERAL EXCISE TAXES

Pursuant to Section 37 of the "Information for Bidders", the Contractor may be exempted from the payment of Federal Excise Taxes in accord with the following:

1. An Excise Tax Exemption Certificate will be provided by DEP where requested by the Contractor, for items that fall within the scope of the Contract and may be exempt from the Federal Excise Tax.

(C) LABOR

Where labor is used under the Contract for intermediate skills and for which no prevailing rate of wages is herein certified, and where there is in existence at the time the Contract is entered into a labor agreement between the Contractor and a duly recognized labor union recognizing the existence of such skills, the Contractor shall pay not less than the rate so agreed upon between the Contractor and such labor organization for such skills.

(D) PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE CITY OF NEW YORK STANDARD CONSTRUCTION CONTRACT

In order to better ensure the availability of materials, fixtures and equipment when needed for the Work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the Work, but only in

strict accordance with and subject to all the terms and conditions set forth in the following subdivisions numbered 1 to 15, unless another method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment. For purposes of this Article 2(D), when the term “materials” is used, it shall also apply to fixtures and/or equipment.

1. The Contractor shall submit to the Commissioner a written request for payment for materials purchased or to be purchased for which the Contractor desires 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 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 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. All costs, charges and expenses arising out of the storage of such materials shall be borne 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. 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 for provision of such storage.

5. The Contractor shall pay any and all costs of handling and delivery of materials to the place of storage, to any approved other 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.

6. 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 its sole cost and expense, shall promptly replace such lost, damaged or destroyed materials with materials of the same character and quality.

7. Should any of the materials paid for by the City hereunder be subsequently rejected or incorporated in the Work in a manner not in accordance with the Contract, the Contractor shall remove and replace such rejected or improperly incorporated material with materials complying with the Contract. Until such materials are replaced, the City will deduct from the value of the materials or from

any other money due to the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.

8. Payment for the cost of materials made hereunder shall not be deemed to be an acceptance of such materials in accordance with the Contract, and the Contractor always retains and must comply with its duty to deliver to the Site and properly incorporate into the Work only materials which comply with the Contract.

9. 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.

10. The Contractor shall comply with all applicable laws, rules and regulations of any governmental body or agency pertaining to the purchase, allocation and use of materials.

11. When requesting payment for such materials, the Contractor shall submit with the partial payment request, duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The Contractor shall provide along with its partial payment request for such materials, appropriate documentation transferring title to such materials from the Contractor to the City. In the event that the invoices state that the material has been purchased by a subcontractor, the Contractor shall also provide appropriate documentation demonstrating transfer of title to such materials from the subcontractor to the Contractor.

12. 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 his or her option, may waive the requirements of subdivision 11, provided the Contractor furnishes evidence in the form of an affidavit of the Contractor, and such other proof as the Commissioner may require, that it 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 subdivision 11 hereof, within seven (7) days after receipt of payment therefor. Failure on the part of the Contractor to submit satisfactory evidence that it has paid in full for all such materials shall preclude it from any payments under the Contract.

13. The Contractor shall include in any succeeding partial payment 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 payment 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 requisition.

14. 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 subdivisions 11 and/or 12 hereof, DEP will pay the Contractor Eighty Five Percent (85%) of the value of such materials, however, in no event shall the Eighty Five Percent (85%) payment exceed the estimated cost of such materials included in the approved detailed estimate breakdown submitted in accordance with Article 41 of the City of New York Standard Construction Contract; if the value exceeds such

estimated cost, the City will pay only Eighty Five Percent (85%) of such approved estimated cost.

15. 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 or Article 45 of the City of New York Standard Construction Contract, less any sums paid pursuant to subdivision 14 herein.

(E) CONFLICTS OF INTEREST

The City Charter in relation to conflicts of interest (Chapter 68, Section 2604) provides, among a number of safeguards, that:

(1) No employee or person whose salary is payable in whole or in part from the City treasury shall accept any valuable gift, whether in the form of service, loan, thing or promise, or any other form from any person, firm or corporation which to his or her knowledge is interested, directly or indirectly, in any manner whatsoever in business dealings with the City; and

(2) Any violation of any of the provisions of this section shall, at the option of the Comptroller, render forfeit and void the Contract, work, business, sale or transaction affected.

Other sections of the City Charter, the New York City Administrative Code and the New York State Penal Law are applicable in implementing the basic conflicts of interest section and under certain circumstances penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

Notice is hereby given that sections of the City Charter, the New York City Administrative Code and the New York State Penal Law alluded to herein shall apply under the terms of this Contract to circumstances relevant to conflicts of interest and shall be extended in application 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 subcontractors.

ARTICLE 3 – CONTRACT DRAWINGS AND SPECIFICATIONS

Related contracts. The Contractor shall study the requirements of any related contracts insofar as they affect the Work or as the Work may affect that of the related contracts and the Contractor will be required to coordinate its Work with that of all other related contractors performing work on such related contracts. The Contractor shall coordinate deliveries in order to avoid delaying or impeding the progress of the Work of any related contractor.

Contract Drawings and Specifications furnished to Contractor. After the Contract has been executed, the Contractor will be furnished with four sets of paper prints of the Contract Drawings and four set of Specifications of the Contract. The Contractor will also be furnished with one set of paper prints and Specifications of any related contracts.

Additional copies. Additional sets of Contract Drawings and Specifications may be issued provided such documents are available in sufficient quantity.

Supplementary drawings. When the Engineer decides to show more fully the Work to be done, or to show required changes, or to rectify errors which may have been discovered, drawings to be known as supplementary drawings and revision sheets with Specifications pertaining thereto will be provided to the Contractor. Changes of a minor nature may be made on the Contract Drawings, in which case the revised Contract Drawings will be issued to the Contractor. The supplementary drawings and revised Contract Drawings shall be as fully binding as the original Contract Drawings, and if such supplementary or revised Contract Drawings require either less or more than the estimated quantities of work, credit to the City or compensation therefor to the Contractor shall be subject to the terms of the City of New York Standard Construction Contract.

Information to subcontractors, manufacturers and others. The Contractor shall furnish each of its subcontractors and materialmen copies of such portions of the Contract, together with all necessary drawings and copies of Specifications, as may be required for the portion of the Work that the respective subcontractors or materialmen shall be responsible for.

Contractor to check drawings and other data. The Contractor shall verify all dimensions, quantities and details shown on Contract Drawings, plans, sketches, schedules, or on any other data received from the Engineer and shall notify the Engineer of all errors, omissions, conflicts and discrepancies found therein.

Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at its sole cost and expense. Figures shall be used in preference to scaled dimensions and large scale drawings in preference to small scale drawings.

"Directed", etc. Whenever 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 imply the direction, requirement, permission, order, designation, or prescription of the Commissioner.

"Approved", etc. "Approved", "acceptable", "satisfactory", and words of similar import shall mean approved, acceptable or satisfactory to the Commissioner.

ARTICLE 4 - TEMPORARY STRUCTURES

Contractor's Field Office. The Contractor shall, during the period of construction, erect or provide for its own use a temporary field office in which readily accessible copies of all Contract Documents and approved Shop and Working Drawings shall be kept. The field office shall be located at the Site, where directed by the Engineer, and shall be provided with the equipment necessary for a functional field office, as approved by the Engineer.

Material Sheds. Material sheds used by the Contractor for the storage of tools, materials and equipment shall be kept at all locations so as not to interfere at any time with the progress of the Work, the location of which shall be subject to the absolute discretion of the Engineer.

Construction of Temporary Structures. All of the Contractor's temporary structures shall be fully constructed and have a neat appearance and shall be painted a uniform gray, unless another color is ordered by the Engineer.

Contractor's Sign. The Contractor shall post and keep posted at the Site, outside of the field office, exterior fence or wall, a legible sign with the full name and address of the Contractor, and the telephone numbers of responsible representatives of the Contractor who can be reached in the event of an emergency.

Private property. When the Contractor temporarily occupies property adjacent to the Work, it shall provide the Engineer with certified copies of agreements which permit the use of such land, unless such permission has been obtained by DEP prior to bidding.

Land for Contractor's use. The Engineer shall in all cases determine the portion of the Site to be used by the Contractor for storage, plant or other purposes.

Obstructions, access. The Contractor shall not obstruct any highway or access thereto from private property except as otherwise specified in the Specifications. The necessary facilities and safeguards to comply with this requirement shall be provided and maintained at the sole cost and expense of the Contractor. 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 other contractor, the Contractor shall remove and restack such materials at no additional cost to the City.

Trespassing prohibited. All employees and subcontractors of the Contractor are prohibited from trespassing on private or public property except where the law permits such entrance for a purpose such as underpinning or otherwise protecting adjoining structures. If it becomes necessary for employees of the Contractor or its subcontractor(s) to enter onto private property for the above stated reasons, the Contractor shall advise DEP of such need. Employees of the Contractor or subcontractor may not enter onto the property until the requisite permission has been obtained and proper notice furnished to the property owner.

ARTICLE 5 - CONTRACTOR'S SUPERINTENDENT

The Contractor shall employ and retain at the Site of the Work, from the commencement until the completion of the Work, a superintendent competent and capable of maintaining proper supervision and care of the Work and acceptable to the Engineer, and who, in the

absence of the Contractor and irrespective of any superintendent or foreman employed by any subcontractor, shall carry out the directions of the Engineer.

ARTICLE 6 - SURVEYS

Lines and grades. All Work shall be constructed according to the lines and grades shown on the Contract Drawings and approved by the Engineer. The Engineer will establish a baseline and benchmark. The Contractor shall establish all other lines, elevations and grades required for the Work and be solely responsible for the accuracy thereof. The Engineer shall be notified prior to the establishment of any line, elevation or grade.

Safeguarding marks. The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the Work, re-establish same if disturbed and bear the entire expense of rectifying work improperly installed due to not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.

Survey before completion of structure. The Contractor for general construction work shall file with the New York City Department of Buildings in the borough where Work is being done or with the New York City Department of Small Business Services, or the local AHJ, a survey by a duly licensed surveyor showing the location of the new structure before completion of the structure, pursuant to Section 28.118.4 of the New York City Building Code or applicable local codes or regulations for projects outside the City. This survey shall show the location of the structure, the elevation of the first tier of beams or of the first floor, the finished grades of the open spaces on the plot, the established curb level and the location of all other structures on the plot, together with the location and boundaries of the lot or plot upon which the structure is constructed. One copy of the application and the survey shall be furnished to the Resident Engineer.

ARTICLE 7 - CONTRACTOR'S DAILY REPORTS

As soon as the Contractor has started Work on the Project, it shall submit to the Engineer written daily reports of the Work performed the previous day by any of its employees, including the employees of its subcontractors.

The reports shall be prepared by the Contractor's Superintendent and shall bear his or her signature. Each report shall contain the following information:

1. The type of materials and/or major equipment being installed by the Contractor and the total number of employees working in each category on that particular day.

2. The names of the subcontractors working and the type of materials and/or major equipment being installed by each together with the total number of employees working for each subcontractor on that particular day.

3. The major construction equipment being used by the Contractor and/or any subcontractor.

ARTICLE 8 – CONTRACTOR’S PLANT

The Contractor shall ensure that it obtains, provides and maintains a sufficient construction plant in close proximity to the Work all times during the progress of the Work in order to meet the demands of the Work, with ample margin for emergencies or

overload. The plant shall be of such capacity conducive to ensure the completion of the Work within the time stipulated in the Contract.

The Contractor may occupy any unused location within the area controlled by DEP with its construction plant, subject to the approval of the Engineer. If the Contractor desires to use additional area outside of that controlled by DEP, the Contractor shall arrange for the use of such area at its sole cost and expense. The location of the Contractor's stationary and mobile equipment shall be subject to the Engineer's approval.

The Engineer shall have the right to reject or condemn any construction plant, staging area, which, in his/her opinion, is unsafe, improper or inadequate. Whether or not the Engineer exercises this right, the Contractor shall not be relieved from its sole responsibility for the safe, proper and lawful construction, maintenance and use of such construction plant, staging area, or for the adequacy of such plant.

The Contractor shall, at its sole cost and expense, stack and restack as needed, all Project materials at locations that are easily accessible and convenient to the Project Site and that do not impede the progress of the Work, or as directed by the Engineer. The Contractor shall also take appropriate measures required to secure and protect all such materials from loss. Should the Contractor wish to stack any project materials on publicly mapped streets, it shall comply with all applicable local, state and federal laws, rules and regulations.

ARTICLE 9 - SECURITY GUARDS AND FIRE GUARDS ON THE SITE

The requirements of the Contract for security guard services and the responsibilities of the Contractor for safeguarding and protecting the Work and Site shall be in accordance with, but not limited to, the respective Division 01 Specifications.

The Contractor will be responsible for safeguarding and protecting its own Work, materials, tools, and equipment. When the provision of security guards is required, each Security Guard shall be required to possess a "Certificate of Fitness" issued by the Fire Department to qualify and serve as a Fire Guard whenever the structure under construction, alteration, or demolition exceeds the prescribed area and height requirements specified in Rule 2.4.1 of the "Rules for Erection, Alteration, Repair, Excavation for and Demolition of Buildings" adopted by the New York City Board of Standards and Appeals under Calendar Number 784-41SR. Each Security Guard shall, during his or her tour of duty, perform the duties of Fire Guards in addition to his or her security obligations.

The use of watchdogs requires the express written approval of DEP and at DEP’s sole discretion.

ARTICLE 10 - CERTIFICATES OF OCCUPANCY AND/OR COMPLETION

If the project structure is a building that is subject to the jurisdiction of the New York City Department of Buildings or similar local AHJ, before substantial completion of the project structure, the Commissioner will file an application for a Certificate of Occupancy or Certificate of Completion with the New York City Department of Buildings or New York City Department of Small Business Services or the local AHJ for project locations outside New York City, as applicable.

In connection with the application for Certificate of Occupancy or Certificate of Completion and before final payment is issued, the Contractor shall arrange for all final inspections by the inspection staffs of the New York City Department of Buildings, New York City Department of Small Business Services and other local AHJs for project locations outside New York City, as applicable, and shall do such remedial work and construction as is required and obtain all reports by such inspection staffs in order that the Certificate of Occupancy and/or Certificate of Completion or other similar certificate if occurring outside the City of New York be procured without delay.

ARTICLE 11 - COORDINATION AMONG CONTRACTORS

The Contractor is alerted to the importance of coordination and cooperation if other contractors are operating at or near the project Site. It is essential to the expeditious completion of this Project that the Contractor meet with any such other contractors at an early stage in the Work, to determine respective space requirements in areas where their operations or installations are in close proximity or are likely to be in conflict or interfere with each other, and to set up regular meetings as Shop Drawings are developed.

The Engineer will provide written notice of the time, place, and agenda of each such scheduled meeting.

The Contractor may also request a meeting by submitting a request for meeting to the Engineer.

Attendance at Coordination Meetings. To allow an orderly sequence of operations agreeable to all contractors, regular meetings shall be scheduled for the purpose of modifying work schedules and to address potential conflicts in work arrangements so that work stoppages and delays may be avoided. Coordination Meetings shall also be opportunities to prepare and circulate coordination drawings for the use and guidance of each contractor.

The Coordination Meetings will be arranged through the Engineer and shall be separate from and in addition to the regular job progress meetings. If it is desired that the architectural or engineering consultants be present at such meeting, this request should be directed to the Engineer.

The Contractor shall only send representatives to the meeting who have the competence and authority to make necessary decisions. Their statements shall commit the Contractor to the procedures, sequence of operations, and time schedules agreed upon.

The requirement to attend and effectively participate in all Progress and Coordination Meetings is subject to strict enforcement by the Commissioner. Failure to be represented at any of these meetings, when scheduled or approved by the Engineer, shall subject the Contractor to liability for any and all damages, delays, costs of alterations, etc., arising from the fact that it or its representatives were not present to coordinate its Work with the work that was scheduled, arrangements on or procedures developed at the meeting or meetings in question.

If, for compelling reasons, Contractor finds that its representative cannot attend a scheduled meeting, it shall give timely notice to the Engineer so that the meeting may be rescheduled.

Where procedures have been agreed upon and coordination drawings accepted by all contractors concerned, Contractor shall adhere to such drawings and procedures, both as to time and performance. No claim of delay or damages by a contractor, if it fails to comply, will be entertained by the Commissioner.

Contractor shall maintain at the Site sufficient competent personnel for the purpose of preparing layout and coordination drawings. Where such drawings are to be prepared by subcontractors, the subcontractor shall have the required personnel on Site in order to measure and asses proper, practical solutions found for problems arising from interferences, etc. and so that proper coordination among trades can be achieved.

ARTICLE 12 - PUBLIC DISSEMINATION OF INFORMATION

The Contractor agrees to hold confidential, both during and after the completion or termination of this Contract, all of the reports, information, or data, furnished to, or prepared, assembled or used by, the Contractor under this Contract. The Contractor agrees to maintain the confidentiality of such reports, information, or data by using a reasonable degree of care, and using at least the same degree of care that the Contractor uses to preserve the confidentiality of its own confidential information. The Contractor agrees that such reports, information, or data shall not be made available to any person or entity without the prior written approval of DEP. The obligation under this Article to hold reports, information or data confidential shall not apply where the Contractor is legally required to disclose such reports, information or data by virtue of a subpoena, court order or otherwise ("disclosure demand"), provided that the Contractor complies with the following: (1) the Contractor shall provide advance notice to the Commissioner, in writing or by e-mail, that it received a disclosure demand for such reports, information or data and (2) if requested by DEP, the Contractor shall not disclose such reports, information or data until the City has exhausted its legal rights, if any, to prevent disclosure of all or a portion of such reports, information, or data. The previous sentence shall not apply if the Contractor is prohibited by law from disclosing to DEP the disclosure demand for such reports, information or data.

The Contractor shall restrict access to confidential information to persons who have a legitimate work-related purpose to access such information. The Contractor agrees that it will instruct its officers, employees, and agents to maintain the confidentiality of any and all information required to be kept confidential by this Contract.

The Contractor, and its officers, employees, and agents shall notify DEP, at any time either during or after completion or termination of this Contract, of any intended statement to the press or any intended issuing of any material for publication in any media of communication (print, news, television, radio, Internet, etc.) regarding the services provided or the data collected pursuant to this Contract at least twenty-four (24) hours prior to any statement to the press or at least five (5) business days prior to the submission of the material for publication, or such shorter periods as are reasonable under the circumstances. The Contractor may not issue any statement or submit any material for publication that includes confidential information as prohibited by this Article.

SCHEDULE A

GENERAL CONDITIONS TO CONSTRUCTION CONTRACT
(INCLUDING GENERAL CONDITIONS RELATING TO ARTICLE 22 -- INSURANCE)

CONTRACT GI-CONS-7

PART I. REQUIRED INFORMATION

INFORMATION FOR BIDDERS **BID BOND** The **Contractor** shall obtain a bid bond in the amount indicated to the right.	5 % of Bid
INFORMATION FOR BIDDERS **PERFORMANCE AND PAYMENT BONDS** The **Contractor** shall obtain performance and payment bonds in the amount indicated to the right.	100 % of Bid
CONTRACT ARTICLE 14. **DATE FOR SUBSTANTIAL COMPLETION** The **Contractor** shall substantially complete the **Work** in the number of calendar days indicated to the right.	1095 consecutive calendar days
CONTRACT ARTICLE 15. **LIQUIDATED DAMAGES** If the **Contractor** fails to substantially complete the **Work** within the time fixed for substantial completion 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 amount indicated to the right.	$500 for each consecutive calendar day over Substantial Completion time
Section 01 33 00 - Submittal Procedures Liquidated Damages	$500 per each additional submission of a Shop Drawing after the third submission.
Section 01 56 39 – Temporary Tree and Plant Protection Liquidated Damages	$500 per day for failure to correct tree protection deficiency within 24 hours of notification
Executive Order No. 39 Rider: City Fleet and Truck Safety Requirements for City Contractors	See Section 3.01 of Rider

CONTRACT ARTICLE 17. **SUB-CONTRACTOR** The **Contractor** shall not make subcontracts totaling an amount more than the percentage of the total **Contract** price indicated to the right.	Not to exceed __40_ % of the **Contract** price
CONTRACT ARTICLE 21. **RETAINAGE** The **Commissioner** shall deduct and retain until the substantial completion of the **Work** the percent value of the **Work** indicated to the right.	__5_ % of the value of the **Work**
CONTRACT ARTICLE 22. **(Per Directions Below)**	
CONTRACT ARTICLE 24. **DEPOSIT GUARANTEE** As security for the faithful performance of its obligations, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to the percentage of the **Contract** price indicated to the right.	1% of **Contract** price
CONTRACT ARTICLE 24. **PERIOD OF GUARANTEE** Periods of maintenance and guarantee other than the period set forth in Article 24.1 are indicated to the right.	2-years for all vegetated materials including trees and other plant material installed from the date of the contractor request for site inspection (see Detailed Specification 32 90 00 – Planting)
CONTRACT ARTICLE 74. **STATEMENT OF WORK** The **Contractor** shall furnish all labor and materials and perform all **Work** in strict accordance with the **Contract Drawings**, **Specifications,** and all **Addenda** thereto**.**	
CONTRACT ARTICLE 75. **COMPENSATION TO BE PAID TO CONTRACTOR** The **City** shall pay and the **Contractor** shall accept in full consideration for the performance of the **Contract**, subject to additions and deductions as provided herein, the total sum **shown in the column to the right,** 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.**	Amount for which the **Contract** was awarded: $ _____ [Agency: If the Bid Price, or any portion thereof, is based on unit prices, insert the words "Not to Exceed" before the amount.]

(GENERAL CONDITIONS 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 a ☐ 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	The minimum limits shall be $2,000,000 per occurrence and $4,000,000 per project aggregate applicable to this Contract unless the Work requires a permit from the Department of Buildings and greater limits of Commercial General Liability Insurance are required pursuant to 1 RCNY section 101-08. Additional Insureds: 1. City of New York, including its officials and employees, with coverage at least as broad as ISO Forms CG 20 10 and CG 20 37, and 2. All person(s) or organization(s), if any, that Article 22.1.1(b) of the **Contract** requires to be named as Additional Insured(s), with coverage at least as broad as ISO Form CG 20 26. The Additional Insured endorsement shall either specify the entity's name, if known, or the entity's title (e.g., Project Manager). 3. [*Agency: If appropriate, insert names of other entities to be covered as Additional Insureds.]*
■ Workers' Compensation Art. 22.1.2 ■ Disability Benefits Insurance Art. 22.1.2 ■ Employers' Liability Art. 22.1.2	Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction.

☐ Jones Act Art. 22.1.3 ☐ U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.3	**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	$ 2,000,000 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
■ Contractors Pollution Liability Art. 22.1.6	$1,000,000 per occurrence $2,000,000 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 □ _____	*[If other type(s) of insurance need to be required under the **Contract**, the Contracting Agency should (a) check the box and fill in the type of insurance in left-hand column, and (b) in this right-hand column, specify appropriate limit(s) and appropriate Named Insured and Additional Insured(s). Note that if Railroad Protective Liability Insurance is required, the appropriate Named Insured is the owner of the railroad and there are no additional insureds.]*

SCHEDULE A

GENERAL CONDITIONS TO CONSTRUCTION CONTRACT

PART III. BROKER'S CERTIFICATION

CERTIFICATES OF INSURANCE

Instructions to New York City Agencies, Departments, and Offices

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

CITY OF NEW YORK
CERTIFICATION BY INSURANCE BROKER OR AGENT

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

_____
[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, 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
(GENERAL CONDITIONS TO CONSTRUCTION CONTRACT)

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**.

NYC Department of Environmental Protection
Office of the Agency Chief Contracting Officer
59-17 Junction Blvd., 17th Floor Bid Room
Flushing NY, 11373
Email: insurance@dep.nyc.gov

NYC PREVAILING WAGE RATES

LABOR LAW ARTICLE 8 - NYC PUBLIC WORKS

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to New York Labor Law Article 8 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work projects. Prevailing rates are required to be annexed to and form part of the public work contract pursuant to Labor Law section 220 (3).

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to Labor Law section 220 (5). The source of the wage and supplement rates, whether a collective bargaining agreement, survey data or other, is listed at the end of each classification.

Agency Chief Contracting Officers should contact the Bureau of Labor Law's Classification Unit with any questions concerning trade classifications, prevailing rates or prevailing practices with respect to procurement on New York City public work contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public work contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public work contracts in the procurement stage must contact the contracting agency responsible for the procurement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public work contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-4443. All callers must have the agency name and contract registration number available when calling with questions on public work contracts. Please direct all other compliance issues to: laborlaw@comptroller.nyc.gov or Bureau of Labor Law, Attn: Paul Brumlik, Office of the Comptroller, 1 Centre Street, Room 651, New York, N.Y. 10007.

Pursuant to Labor Law § 220 (3-a) (a), the appropriate schedule of prevailing wages and benefits must be posted in a prominent and accessible place at all public work sites along with the Construction Poster provided on our web site at comptroller.nyc.gov/wages. In addition, covered employees must be given the appropriate schedule of prevailing wages and benefits along with the Worker Notice provided on our web site at the time the public work project begins, and with the first paycheck to each such employee after July first of each year.

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site comptroller.nyc.gov/wages. Contractors must pay the wages and supplements in effect when the worker, laborer, mechanic performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site comptroller.nyc.gov/wages.

Prevailing rates and ratios for apprentices are published in the Construction Apprentice Prevailing Wage Schedule. Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the

New York State Department of Labor, may be paid at the apprentice rates. Apprentices who are not so registered must be paid as journey persons.

New York City public work projects awarded pursuant to a Project Labor Agreement ("PLA") in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA's pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor's Office of Contract Services (MOCS) web page at:

https://www1.nyc.gov/site/mocs/legal-forms/project-labor-agreements.page

All the provisions of Labor Law Article 8 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller in accordance with the trade classifications in this schedule; however, we will enforce shift, premium, overtime and other non-standard rates as they appear in a project's pre-negotiated labor agreement.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

1) **Provide bona fide fringe benefits which cost the employer no less than the prevailing supplemental benefits rate; or**
2) **Supplement the employee's hourly wage by an amount no less than the prevailing supplemental benefits rate; or**
3) **Provide a combination of bona fide fringe benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.**

Although prevailing wage laws do not require employers to provide bona fide fringe benefits (as opposed to wage supplements) to their employees, other laws may. For example, the Employee Retirement Income Security Act, 29 U.S.C. § 1001 et seq., the Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq., and the New York City Paid Sick Leave Law, N.Y.C. Admin. Code § 20-911 et seq., require certain employers to provide certain benefits to their employees. Labor agreements to which employers are a party may also require certain benefits. The Comptroller's Office does not enforce these laws or agreements.

Employers must provide prevailing supplemental benefits at the straight time rate for each hour worked unless otherwise noted in the classification.

Paid Holidays, Vacation and Sick Leave when listed must be paid or provided in addition to the prevailing hourly supplemental benefit rate.

For more information, please refer to the Comptroller's Prevailing Wage Law Regulations in Title 44 of the Rules of the City of New York, Chapter 2, available at comptroller.nyc.gov/wages.

Paul Brumlik
Director of Classifications
Bureau of Labor Law

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ASBESTOS HANDLER
SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $59.81
Supplemental Benefit Rate per Hour: $57.77

Blaster - Hydraulic Trac Drill

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $53.95
Supplemental Benefit Rate per Hour: $57.77

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $53.12
Supplemental Benefit Rate per Hour: $57.77

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.60
Supplemental Benefit Rate per Hour: $57.77

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.30
Supplemental Benefit Rate per Hour: $57.77

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
Columbus Day
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day
Thanksgiving 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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $70.38
Supplemental Benefit Rate per Hour: $50.33
Supplemental Note: For time and one half overtime - $74.92 For double overtime - $99.51

Overtime Description
For Repair and Maintenance work:
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
For New Construction work:
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day

President's Day
Memorial Day
Independence Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Juneteenth

Quadruple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
Good Friday
Day after Thanksgiving
Day before Christmas
Day before New Year's Day

Shift Rates
On jobs requiring two (2) or three (3) shifts, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars ($2.00) per hour. The third shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars and twenty-five cents ($2.25) per hour.

(Local #5)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $61.29
Supplemental Benefit Rate per Hour: $46.60

Overtime Description
Time and one half the regular rate after a 7 hour day. If working on a job that is predominately Pointer, Cleaner, Caulker work, then Time and one half the regular rate after an 8 hour day.

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be a 15% wage premium with no premium for supplemental benefits. There must be a first shift in order to work a second shift.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $60.05
Supplemental Benefit Rate per Hour: $50.83

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Day before Christmas
Christmas Day
Day before New Year's Day

Paid Holidays
None

Shift Rates
The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight hours pay for seven hours of work, nine hours pay for eight hours of work. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - HEAVY CONSTRUCTION WORK
(Construction of Engineered Structures and Building Foundations including all form work)

Heavy Construction Work

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.59
Supplemental Benefit Rate per Hour: $57.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Carpenters are employed, single time will be paid for each shift.

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Excludes Engineered Structures and Building Foundations)

Carpenter High Rise A

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $51.48
Supplemental Benefit Rate per Hour: $44.74

Carpenter High Rise B

Carpenter High Rise B worker is excluded from high risk operations such as erection decking, perimeter debris netting, leading edge work, self-climbing form systems, and the installation of cocoon systems unless directly supervised by a Carpenter High Rise A worker.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.89
Supplemental Benefit Rate per Hour: $18.05

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be 113% of the straight time hourly wage rate. However, any shift beginning after 5:00 P.M. shall be paid at time and one half the regular hourly rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST

Carpenter - Hod Hoist

(Assisted by Mason Tender)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.20
Supplemental Benefit Rate per Hour: $51.20

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates

The second shift will receive 112% of the straight time hourly rate. Benefit fund contributions shall be paid at the straight time rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - WOOD WATER STORAGE TANK

Tank Mechanic

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.58
Supplemental Benefit Rate per Hour: $27.26

Tank Helper

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.04
Supplemental Benefit Rate per Hour: $27.18

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Day after Thanksgiving
1/2 day on Christmas Eve if work is performed in the A.M.
Christmas Day
1/2 day on New Year's Eve if work is performed in the A.M.

Vacation

Employed for one (1) year.....one (1) week vacation (40 hours)
Employed for three (3) years.....two (2) weeks vacation (80 hours)
Employed for more than twenty (20) years.....three (3) weeks vacation (120 hours)

SICK LEAVE:

Two (2) sick days after being employed for twenty (20) years.

(Carpenters District Council)

CEMENT & CONCRETE WORKER
Building Work

Cement & Concrete Worker

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.28
Supplemental Benefit Rate per Hour: $34.20
Supplemental Note: $39.20 on Saturdays; $44.20 on Sundays & Holidays

Cement & Concrete Worker - (Hired after 2/6/2016)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.80
Supplemental Benefit Rate per Hour: $26.20
Supplemental Note: $29.20 on Saturdays; $32.20 on Sundays & Holidays

Overtime Description
Time and one half the regular rate after 7 hour day (time and one half the regular rate after an 8 hour day when working with Dockbuilders on pile cap forms and for work below street level to the top of the foundation wall, not to exceed 2 feet or 3 feet above the sidewalk-brick shelf, when working on the foundation and structure.)

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day before Christmas Day
1/2 day before New Year's Day

Shift Rates
All night shifts are paid at straight time plus 10% differential.

(Cement & Concrete Workers District Council 16)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $59.87
Supplemental Benefit Rate per Hour: $34.76
Supplemental Note: Supplemental benefit time and one half rate: $63.22; Double time rate: double the base supplemental benefit rate.

Overtime Description
Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on Sunday. Four Days a week at Ten (10) hours straight time is allowed.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

Shift Rates
For off shift work, (at times other than the regular 7:00 A.M. to 3:30 P.M. work day) a cement mason shall be paid at the regular hourly rate plus a 25% per hour differential.

(Local #780) (BCA)

CORE DRILLER
Test Boring

Core Driller

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.78
Supplemental Benefit Rate per Hour: $36.07

Core Driller Helper

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.15
Supplemental Benefit Rate per Hour: $36.07

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.37
Supplemental Benefit Rate per Hour: $36.07
eucli

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.61
Supplemental Benefit Rate per Hour: $36.07

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $26.83
Supplemental Benefit Rate per Hour: $36.07

Overtime Description
Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Memorial Day

Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates

When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive two dollars ($2.00) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $61.82
Supplemental Benefit Rate per Hour: $63.63

Overtime Description

The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits.

Overtime

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.

Derrick Person & Rigger- Handset

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $59.67
Supplemental Benefit Rate per Hour: $62.64

Overtime Description
The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

(Local #197)

DIVER

Diver (Marine)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $77.46
Supplemental Benefit Rate per Hour: $57.84

Diver Tender (Marine)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.00
Supplemental Benefit Rate per Hour: $57.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.59
Supplemental Benefit Rate per Hour: $57.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day

President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Dockbuilders are employed, single time will be paid for each shift.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Including work involving the delivery to and hauling from such worksites of aggregate supply construction materials and any time spent loading/unloading

Driver - Dump Truck

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.07
Supplemental Benefit Rate per Hour: $61.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $25.50; at double time rate - $34.00

Driver - Tractor Trailer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.76
Supplemental Benefit Rate per Hour: $60.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $32.83; at double time rate - $41.60

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.07

Supplemental Benefit Rate per Hour: $60.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $32.83; at double time rate - $41.60

Driver – Boom Truck

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $52.51
Supplemental Benefit Rate per Hour: $60.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $32.83; at double time rate - $41.60

Driver – Goldhofer & Self Propelled Modular Trailer (SPMT)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $53.51
Supplemental Benefit Rate per Hour: $60.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $32.83; at double time rate - $41.60

Overtime Description
For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
Off shift work commencing between 6:00 P.M. and 5:00 A.M. shall work eight and one half (8 1/2) hours allowing for one half hour for lunch

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Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $44.50
Supplemental Benefit Rate per Hour: $54.88
Supplemental Note: Over 40 hours worked: time and one half rate $22.59; double time rate $30.12

Overtime Description
For Paid Holidays: Employees who do not work on a contractual holiday shall be compensated two (2) hours extra pay in straight time wages and benefits for every day on which the Employee does not pass up a day's work during the calendar week (Sunday through Saturday) of the holiday, up to a maximum of ten (10) hours in wages and eight (8) hours in benefit contributions for the holiday

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Christmas Day

(Local #282)

ELECTRICIAN

(Including installation of low voltage cabling carrying data, video and/or voice on building construction/alteration/renovation projects.)

Electrician "A" (Regular Day / Day Shift)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $70.28
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $72.74
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Regular Day Overtime after 7 hrs / Day Shift Overtime after 8 hrs)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $96.00
Supplemental Benefit Rate per Hour: $72.34
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $96.00
Supplemental Benefit Rate per Hour: $74.80
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $75.10
Supplemental Benefit Rate per Hour: $78.93
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $75.10
Supplemental Benefit Rate per Hour: $81.66
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift Overtime after 7.5 hours)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $112.65
Supplemental Benefit Rate per Hour: $81.35
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $112.65
Supplemental Benefit Rate per Hour: $84.07
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $84.12
Supplemental Benefit Rate per Hour: $86.28
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $84.12
Supplemental Benefit Rate per Hour: $89.25
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift Overtime after 7 hours)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $126.18
Supplemental Benefit Rate per Hour: $88.98
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $126.18
Supplemental Benefit Rate per Hour: $91.96
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on a holiday.
New Year's Day
Martin Luther King Jr. Day
President's Day

Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate. For three or less workers performing 8 hours temporary light and/or power the supplemental benefit rate is $27.91, effective 04/15/2027 the supplemental benefit rate is $29.91 - See * Supplemental Benefit Rate per Hour Note above.

Electrician "M" 1st Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $26.79

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $27.42

Electrician "M" 1st Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $41.25
Supplemental Benefit Rate per Hour: $28.52

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $41.25
Supplemental Benefit Rate per Hour: $29.16

Electrician "M" 2nd Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $28.50
Supplemental Benefit Rate per Hour: $27.32

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $28.50
Supplemental Benefit Rate per Hour: $27.97

Electrician "M" 2nd Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $42.75
Supplemental Benefit Rate per Hour: $29.12

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $42.75
Supplemental Benefit Rate per Hour: $29.77

Electrician "M" 3rd Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $30.50
Supplemental Benefit Rate per Hour: $28.40

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $30.50
Supplemental Benefit Rate per Hour: $29.05

Electrician "M" 3rd Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $45.75
Supplemental Benefit Rate per Hour: $30.33

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $45.75
Supplemental Benefit Rate per Hour: $30.98

Electrician "M" 4th Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.01

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.68

Electrician "M" 4th Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $50.25
Supplemental Benefit Rate per Hour: $32.13

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $50.25

Supplemental Benefit Rate per Hour: $32.80

Electrician "M" 5th Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $36.50
Supplemental Benefit Rate per Hour: $31.62

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $36.50
Supplemental Benefit Rate per Hour: $32.31

Electrician "M" 5th Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $54.75
Supplemental Benefit Rate per Hour: $33.93

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $54.75
Supplemental Benefit Rate per Hour: $34.61

Electrician "M" 6th Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $43.50
Supplemental Benefit Rate per Hour: $35.39

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $43.50
Supplemental Benefit Rate per Hour: $36.11

Electrician "M" 6th Year (Overtime)

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $65.25
Supplemental Benefit Rate per Hour: $38.14

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $65.25
Supplemental Benefit Rate per Hour: $38.85

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: 7/1/2026 - 3/11/2027
Wage Rate per Hour: $39.45
Supplemental Benefit Rate per Hour: $23.33
Supplemental Note: $21.20 only after 8 hours worked in a day

Effective Period: 3/12/2027 - 6/30/2027
Wage Rate per Hour: $40.45
Supplemental Benefit Rate per Hour: $23.86
Supplemental Note: $21.74 only after 8 hours worked in a day

Overtime Description
Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.
Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:30 A.M.

Vacation

At least 1 year of employment.....ten (10) days
5 years or more of employment.....fifteen (15) days
10 years of employment.....twenty (20) days
Plus one Personal Day per year

Sick Days:
One day per Year. Up to 4 vacation days may be used as sick days.

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2026 - 4/21/2027
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $72.46
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/22/2027 - 6/30/2027
Wage Rate per Hour: $64.00
Supplemental Benefit Rate per Hour: $74.92
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2026 - 4/21/2027
Wage Rate per Hour: $49.66
Supplemental Benefit Rate per Hour: $53.91
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/22/2027 - 6/30/2027
Wage Rate per Hour: $49.66
Supplemental Benefit Rate per Hour: $55.91
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2026 - 4/21/2027
Wage Rate per Hour: $43.61
Supplemental Benefit Rate per Hour: $48.96
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Effective Period: 4/22/2027 - 6/30/2027
Wage Rate per Hour: $43.61
Supplemental Benefit Rate per Hour: $50.89
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime Description
Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.
Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.
Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $86.43
Supplemental Benefit Rate per Hour: $43.43

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $89.76
Supplemental Benefit Rate per Hour: $44.53

Overtime Description
For New Construction: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 6:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 6:00pm and 5:00 am shall be paid time and one half.

Overtime
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $68.06
Supplemental Benefit Rate per Hour: $43.38

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $70.72
Supplemental Benefit Rate per Hour: $44.48

Overtime Description
For Scheduled Service Work: Double time - work scheduled in advance by two or more workers performed on Sundays, Holidays, and between midnight and 5:00am.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Afternoon shift - regularly hourly rate plus a (15%) fifteen percent differential. Graveyard shift - time and one half the regular rate.

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ENGINEER

Engineer - Heavy Construction Operating Engineer I

Cherrypickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $79.50
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $127.20

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherrypickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar nature, shot blaster, skid steer machines and machines of a similar nature including bobcat, pile rig rubber-tired excavator (37,000 lbs. and under), 2 person auger.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $76.95
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $123.12

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $72.72
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $116.35

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar

nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $76.55
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $122.48

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $102.42
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $163.87

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.50
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $77.60

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.90
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $79.84

Engineer - Heavy Construction Service Engineer

Gradalls: Concrete Pumps: Power Houses: Driving Truck Cranes: Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: $68.42
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $109.47

Engineer - Heavy Construction Service Mechanic

Shovels: Cranes: Draglines: Backhoes: Keystones: Pavers: Trenching Machines: Gunite Machines: Compressors (three (3) or more in Battery): Crawler Cranes- having a straight lattice boom with no attachment or luffing boom, no jib and no auxiliary attachment.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.50
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $72.80

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $73.88
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $118.21

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $68.81
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $110.10

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.83
Supplemental Benefit Rate per Hour: $51.76
Supplemental Note: $95.97 on overtime
Shift Wage Rate: $74.93

Overtime Description

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $63.77
Supplemental Benefit Rate per Hour: $50.85
Supplemental Note: $94.15 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.27
Supplemental Benefit Rate per Hour: $50.85
Supplemental Note: $94.15 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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $60.35
Supplemental Benefit Rate per Hour: $50.85
Supplemental Note: $94.15 on overtime

Engineer - Building Work Oilers II

Oilers on Crawler Cranes, Backhoes, Trenching Machines, Gunite Machines, Compressors (three or more in Battery).

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.39
Supplemental Benefit Rate per Hour: $50.85
Supplemental Note: $94.15 on overtime

Overtime Description
On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time will be paid for each shift.

(Local #15)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.27
Supplemental Benefit Rate per Hour: $29.92
Supplemental Note: Overtime Benefit Rate - $35.66 per hour (time & one half) $41.39 per hour (double time).

Instrument Person

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.26
Supplemental Benefit Rate per Hour: $29.92
Supplemental Note: Overtime Benefit Rate -$35.66 per hour (time & one half) $41.39 per hour (double time).

Rodperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $33.55
Supplemental Benefit Rate per Hour: $29.92
Supplemental Note: Overtime Benefit Rate - $35.66 per hour (time & one half) $41.39 per hour (double time).

Rodperson 1st Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $29.92
Supplemental Note: Overtime Benefit Rate - $35.66 per hour (time & one half) $41.39 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (BUILDING CONSTRUCTION)
(Construction of Building Projects, Concrete Superstructures, etc.)

Field Engineer - BC Party Chief

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $71.62
Supplemental Benefit Rate per Hour: $46.38
Supplemental Note: Overtime Benefit Rate - $65.85 per hour (time & one half) $85.31 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.50
Supplemental Benefit Rate per Hour: $46.38
Supplemental Note: Overtime Benefit Rate - $65.85 per hour (time & one half) $85.31 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.86
Supplemental Benefit Rate per Hour: $46.38
Supplemental Note: Overtime Benefit Rate - $65.85 per hour (time & one half) $85.31 per hour (double time).

Overtime Description
Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (HEAVY CONSTRUCTION)
(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $80.18
Supplemental Benefit Rate per Hour: $51.37
Supplemental Note: Overtime benefit rate - $73.21 per hour (time & one half), $95.05 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $56.72
Supplemental Benefit Rate per Hour: $51.37
Supplemental Note: Overtime benefit rate - $73.21 per hour (time & one half), $95.05 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.30
Supplemental Benefit Rate per Hour: $51.37
Supplemental Note: Overtime benefit rate - $73.21 per hour (time & one half), $95.05 per hour (double time).

Field Engineer - HC Rodperson 1st Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $51.37
Supplemental Note: Overtime benefit rate - $73.21 per hour (time & one half), $95.05 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
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day

Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $76.11
Supplemental Benefit Rate per Hour: $49.70
Supplemental Note: Overtime benefit rate - $70.71 per hour (time & one half), $91.71 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $53.33
Supplemental Benefit Rate per Hour: $49.70
Supplemental Note: Overtime benefit rate - $70.71 per hour (time & one half), $91.71 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $33.45
Supplemental Benefit Rate per Hour: $49.70
Supplemental Note: Overtime benefit rate - $70.71 per hour (time & one half), $91.71 per hour (double time).

Field Engineer - Steel Erection Rodperson 1st Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $49.70
Supplemental Note: Overtime benefit rate - $67.22 per hour (time & one half), $87.07 per hour (double time).

Overtime Description
Time and one half the regular rate for Saturday for the first eight hours worked.
Double time the regular rate for Saturday for work performed in excess of eight hours.

Overtime
Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one (1) day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - OPERATING

Operating Engineer - Road & Heavy Construction I

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $95.27
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $152.43

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $98.67
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $157.87

Operating Engineer - Road & Heavy Construction III

Mine Hoists (Cranes, etc. when used as Mine Hoists)

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: $101.86
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $162.98

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $99.37
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $158.99

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (working alongside Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $97.41
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $155.86

Operating Engineer - Road & Heavy Construction VI

Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power Houses (Low Air Pressure Units).

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $92.51
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $148.02

Operating Engineer - Road & Heavy Construction VII

Barrier Movers, Barrier Transport and Machines of a Similar Nature.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $74.63
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $119.41

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.84
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $73.02

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $87.98
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $140.77

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $80.83
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $129.33

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.68
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $100.29

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $93.50
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $149.60

Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $90.57
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $144.91

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $86.55
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $138.48

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $58.23
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $93.17

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $82.63
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $132.21

Operating Engineer - Road & Heavy Construction XVII

On-Site concrete plant engineer, On-site Asphalt Plant Engineer, and Vibratory console.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $83.23
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Shift Wage Rate: $133.17

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $119.67
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $191.47

Operating Engineer - Paving I

Asphalt Spreaders, Autogrades (C.M.I.), Roto/Mil

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $92.51
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $148.02

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $90.14
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $144.22

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $76.11
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $121.78

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $98.93
Supplemental Benefit Rate per Hour: $40.40

Supplemental Note: $74.50 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $58.68
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $78.97
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $103.35
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $165.36

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes, Fork Lifts and Boom Trucks.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $99.29
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $158.86

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $54.73
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $87.57

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine. (Public Works Only)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $52.08
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
Shift Wage Rate: $83.33

Operating Engineer - Building Work I

Forklifts, Plaster (Platform machine), Plaster Bucket, Concrete Pump and all other equipment used for hoisting material.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $74.34
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $55.45
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $94.79
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $100.43
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $82.68
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $81.79
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $64.87
Supplemental Benefit Rate per Hour: $40.40
Supplemental Note: $74.50 overtime hours
For New House Car projects Wage Rate per Hour $51.61
For New House Car projects: Supplemental Benefit overtime hours: $74.50

Overtime Description
On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

For House Cars and Rack & Pinion only: Overtime paid at time and one-half for all hours in excess of eight hours in a day, Saturday, Sunday and Holidays worked.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving

Christmas Day

Shift Rates

When two (2) or more shifts are employed, single time will be paid for each shift.
For Steel Erection Only: Shifts may be worked at the single time rate at other than the regular working hours (8:00 A.M. to 4:30 P.M.) on the following work ONLY: Heavy construction jobs on work below the street level, over railroad tracks and on building jobs.

(Operating Engineer Local #14)

FLAGGER

Flagger to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, this title includes traffic control duty only for City public works contracts and subcontracts solicited on or after July 1, 2024.

On City public works contracts and subcontracts solicited on or after July 1, 2024, traffic control worker to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

If the trade performing the underlying work does not regularly employ a flagger or traffic control worker, then one of the following titles must be used on such projects:
Laborer - Heavy & Highway
Laborer - Paver & Roadbuilder
Laborer - Paver & Roadbuilder Line Striping (Roadway)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $60.05
Supplemental Benefit Rate per Hour: $50.83

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Day before Christmas
Christmas Day
Day before New Year's Day

Shift Rates
Two shifts may be utilized with the first shift working 8 a.m. to the end of the shift at straight time rate of pay. The wage rate for the second shift consisting of 7 hours shall be paid at 114.29% of straight time wage rate. The wage rate for the second shift consisting of 8 hours shall be paid 112.5% of the straight time wage rate. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

GLAZIER
(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.72
Supplemental Benefit Rate per Hour: $60.05

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
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

DC9 (Local #1087)

GLAZIER - REPAIR & MAINTENANCE
(For the Installation of Glass - All repair and maintenance work on a particular building.)

Craft Jurisdiction for repair, maintenance and fabrication

Plate glass replacement, Storm windows and storm doors, Herculite door repairs, Door closer repairs, Glass tinting.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.32
Supplemental Benefit Rate per Hour: $28.68

Overtime
Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays
New Year's Day
President's Day
Memorial Day

Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

DC9 (Local #1087)

HAZARDOUS MATERIAL HANDLER
(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

Handler

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.00
Supplemental Benefit Rate per Hour: $26.27

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day
Easter

Paid Holidays
None

(Local #78 and Local #12A)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $73.21
Supplemental Benefit Rate per Hour: $37.81

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
None

Shift Rates
The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium. There must be a first shift to work the second shift, and a second shift to work the third shift. Off-hour jobs in occupied buildings may be worked on weekdays with an increment of one-dollar ($1.00) per hour and eight (8) hours pay for seven (7) hours worked.

(Local #12) (BCA)

HOUSE WRECKER
(TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.60
Supplemental Benefit Rate per Hour: $32.80

House Wrecker - Tier B

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.83
Supplemental Benefit Rate per Hour: $25.21

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.

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.65
Supplemental Benefit Rate per Hour: $69.29
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When two or three shifts are employed on a job, Monday through Friday, each shift will be paid eight (8) hours at the straight time rate for eight (8) hours of work; at time and one-half the regular straight time rate for the first two (2) hours of overtime worked beyond eight (8) hours; and at double time for all work thereafter. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight (8) hours will be paid at straight time rate for seven (7) hours of work, and all overtime shall be paid at time and one-half the regular straight time rates. On Saturday, Sundays and Holidays, time and one-half the regular straight time rate shall be paid for all work up to seven (7) hours and double time shall be paid for all work thereafter.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $59.45
Supplemental Benefit Rate per Hour: $94.63
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

(Local #40 & #361)

LABORER – HEAVY & HIGHWAY
(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer - Heavy & Highway

Excavation and foundation work for buildings, heavy construction, street pipe laying, engineering work, and hazardous waste removal in connection with the above work. Landscaping tasks in connection with heavy construction work, engineering work and building projects. Projects include, but are not limited to pollution plants, sewers, parks, subways, bridges, highways, etc. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.60
Supplemental Benefit Rate per Hour: $57.77

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
Columbus Day
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day
Thanksgiving 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)

LABORER - PAVER & ROADBUILDER

Laborer - Paver & Roadbuilder

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work for installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry/seal coating, paving stones, maintenance of safety surfaces; play equipment installation, and other related work. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.98

Supplemental Benefit Rate per Hour: $56.65
Supplemental Note: For time and one half overtime - $61.53 For double overtime - $66.40

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.85
Supplemental Benefit Rate per Hour: $56.65
Supplemental Note: For time and one half overtime - $61.53 For double overtime - $66.40

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.98
Supplemental Benefit Rate per Hour: $56.65
Supplemental Note: For time and one half overtime - $61.53 For double overtime - $66.40

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.85
Supplemental Benefit Rate per Hour: $56.65
Supplemental Note: For time and one half overtime - $61.53 For double overtime - $66.40

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $51.45
Supplemental Benefit Rate per Hour: $56.65
Supplemental Note: For time and one half overtime - $61.53 For double overtime - $66.40

Overtime Description

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day

Paid Holidays

Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours at the straight time rate since only one half (1/2) hour is allowed for meal time.
When two or more shifts are employed, single time will be paid for each shift.

(Local #1010)

LABORER - PAVER & ROADBUILDER LINE STRIPING (ROADWAY)

(Road markings, applications of striping and surface coatings on Roadways, Bus lanes, Bike lanes & Pedestrian Plazas)

Striping - Machine Operator (Thermoplastic & Epoxy)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.00
Supplemental Benefit Rate per Hour: $25.77
Supplemental Note: For time and one half overtime - $28.02 For double overtime - $30.27

Lineperson - Crew Chief

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.00
Supplemental Benefit Rate per Hour: $25.77
Supplemental Note: For time and one half overtime - $28.02 For double overtime - $30.27

Laborer: Striping Assistant - Green Infrastructure - Traffic Control

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $41.00

Supplemental Benefit Rate per Hour: $25.77
Supplemental Note: For time and one half overtime - $28.02 For double overtime - $30.27

Overtime Description
For Paid Holidays: Employees will only receive Holiday Pay for holidays not worked if said employee worked both the regularly scheduled workday before and after the holiday.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Shift Rates
Vacation
As of January 1, 2026, Vacation removed and its value was incorporated in the Supplemental Benefit rate above.

Vacation
Vacation Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation.

(Local #1010)

LANDSCAPING

Landscaper (Year 6 and above)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.66
Supplemental Benefit Rate per Hour: $18.55

Landscaper (Year 3 - 5)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.39
Supplemental Benefit Rate per Hour: $18.55

Landscaper (up to 3 years)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.19
Supplemental Benefit Rate per Hour: $18.55

Groundsperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.19
Supplemental Benefit Rate per Hour: $18.55

Tree Remover / Pruner

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.08
Supplemental Benefit Rate per Hour: $18.55

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.28
Supplemental Benefit Rate per Hour: $18.55

Watering - Plant Maintainer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.85
Supplemental Benefit Rate per Hour: $18.55

Overtime Description
For all overtime work performed, supplemental benefits shall include an additional seventy-five ($0.75) cents per hour.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
Memorial Day
Independence Day

Labor Day
Thanksgiving Day
Christmas Day

Shift Rates

Work performed on a 4pm to 12am shift has a 15% differential. Work performed on a 12am to 8am shift has a 20% differential.

(Local #175)

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $60.21
Supplemental Benefit Rate per Hour: $44.96

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $60.61
Supplemental Benefit Rate per Hour: $45.31

Marble Finisher

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $46.17
Supplemental Benefit Rate per Hour: $41.91

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $46.49
Supplemental Benefit Rate per Hour: $42.11

Marble Polisher

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $45.11
Supplemental Benefit Rate per Hour: $35.01

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $45.47
Supplemental Benefit Rate per Hour: $35.21

Marble Maintenance Finisher

Effective Period: 7/1/2026 - 7/1/2026

Wage Rate per Hour: $28.30
Supplemental Benefit Rate per Hour: $15.94

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $28.56
Supplemental Benefit Rate per Hour: $16.09

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

MASON TENDER
Building Laborer

Mason Tender

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $42.55
Supplemental Benefit Rate per Hour: $34.64

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 114.3% of straight time on wage rate and fringe benefit 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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.40
Supplemental Benefit Rate per Hour: $26.89

Mason Tender Tier B

Tier B Interior Demolition Worker performs manual work and work incidental to demolition work, such as loading and carting of debris from the work site to an area where it can be loaded in to bins/trucks for removal.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.59
Supplemental Benefit Rate per Hour: $21.21

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.85
Supplemental Benefit Rate per Hour: $57.11
Supplemental Note: For time and one half overtime - $69.11 For double overtime - $90.51

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Off-shift work outside of normal working hours shall receive straight time rate plus $12 per hour for the first eight (8) hours.

(Local #46)

MILLWRIGHT

Millwright

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.03
Supplemental Benefit Rate per Hour: $59.98

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Second and third shifts receives the straight time rate of pay plus fifteen (15%) percent allowing for one half hour for a meal. There must be a first shift to work a second and third shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) percent for weekday hours.

(Local #740)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $55.82
Supplemental Benefit Rate per Hour: $49.47

Mosaic Mechanic- Mosaic & Terrazzo Mechanic / Machine Operator Grinder

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $54.22
Supplemental Benefit Rate per Hour: $49.47

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.50
Supplemental Benefit Rate per Hour: $45.72
Supplemental Note: Supplemental benefits for time and one half overtime - $54.78, For double overtime - $63.83

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.50
Supplemental Benefit Rate per Hour: $45.72
Supplemental Note: Supplemental benefits for time and one half overtime - $54.78, For double overtime - $63.83

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(District Council of Painters #9)

PAINTER - BRIDGE & STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.00
Supplemental Benefit Rate per Hour: $57.21

Painter - Power Tool

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $64.00

Supplemental Benefit Rate per Hour: $57.21
Overtime Wage Rate: $7.00 above the "Painters on Structural Steel" overtime rate.

Overtime Description
Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift is paid at regular hourly wage rates plus a ten percent (10%) differential. There must be a first shift to work a second shift.

(Local #806)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $35.00
Supplemental Benefit Rate per Hour: $12.84

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $35.95
Supplemental Benefit Rate per Hour: $12.84

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.50
Supplemental Benefit Rate per Hour: $12.84

ASSISTANT METAL POLISHER

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.19
Supplemental Benefit Rate per Hour: $12.47

ASSISTANT METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.94
Supplemental Benefit Rate per Hour: $12.47

ASSISTANT METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.69
Supplemental Benefit Rate per Hour: $12.47

Overtime Description
All work performed on Saturdays shall be paid at time-in-a half. The exception being; for suspended scaffold work and work deemed as a construction project; an eight (8) hour shift lost during the week due to circumstances beyond the control of the employer, up to a maximum of eight (8) hours per week, may be worked on Saturday at the straight time rate.

Holiday Pay
Double time the regular rate for work on the following Holiday plus the day's pay. Only employees who have completed one year of service, including any trial period shall be eligible for holiday pay.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Shift Rates
Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.39
Supplemental Benefit Rate per Hour: $29.75

Assistant Sign Painter

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $41.98
Supplemental Benefit Rate per Hour: $29.04

Overtime Description
If any employee is required to work on any of the paid holidays then the employee shall receive double time rate of wages as well as the holiday pay for that day.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Personal Day

Vacation
At least 1 year of employment.....1 week

2 years or more of employment.....2 weeks
8 years or more of employment.....3 weeks

(Local #8A-28A)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.02
Supplemental Benefit Rate per Hour: $46.90
Supplemental Note: Supplemental benefits for time and one half overtime - $55.87, For double overtime - $64.84

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
None

(District Council of Painters #9)

PLASTERER

Plasterer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.51
Supplemental Benefit Rate per Hour: $32.78

Plasterer II

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.11
Supplemental Benefit Rate per Hour: $16.70

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

Shift Rates
When it is not possible to conduct work during regular working hours (between 6:00am and 4:30pm), a shift differential shall be paid at the regular hourly rate plus a twelve percent (12%) per hour differential. Workers on shift work shall be allowed a paid one-half hour meal break.

(Local #262)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $42.55
Supplemental Benefit Rate per Hour: $34.64

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 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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $78.05
Supplemental Benefit Rate per Hour: $46.40
Supplemental Note: Double time shall be paid for supplemental benefits during overtime work.

Plumber - Temporary Services

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.52
Supplemental Benefit Rate per Hour: $37.04
Supplemental Note: Double time shall be paid for supplemental benefits during overtime work.

Overtime Description
Where the plumbing contract price is one and one half million dollars ($1,500,000.00) or less, double time the regular rate after an 8 hour day.

Overtime
Double time the regular rate after a 7 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Shift work, when directly specified in public agency or authority contract documents, and continues for a period of not less than ten (10) consecutive work days. A shift shall consist of seven (7) hours with one-half (1/2) hour for lunch after the first four (4) hours of each shift. A premium of thirty percent (30%) for wages and supplemental benefits on shift work performed Monday through Friday on the 4 P.M. and midnight shifts. For shift work performed on weekends the shift premium shall be fifty percent (50%) of wages and supplemental benefits. For shift work performed on holidays designated below, double time wages and supplemental benefits shall be paid. Also noted that the normal workday Monday through Friday 8:00 A.M. to 3:30 P.M. is not considered shift work, and therefore not subject to shift premium.

(Plumbers Local #1)

PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)
Mechanical Equipment and Service work is any repair and/or replacement of the present plumbing system that does not change existing roughing or water supply lines. Projects regardless of work type which have approved plans and specifications wherein the plumbing exceeds $725,000 are excluded.

Plumber

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.90
Supplemental Benefit Rate per Hour: $22.86

Overtime
Time and one half the regular rate after an 8 hour day.

Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $54.25
Supplemental Benefit Rate per Hour: $33.21

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates

Shift work, when directly specified in public agency or authority contract documents, and continues for a period of not less than ten (10) consecutive work days. A shift shall consist of seven (7) hours with one-half (1/2) hour for lunch after the first four (4) hours of each shift. A premium of thirty percent (30%) for wages and supplemental benefits on shift work performed Monday through Friday on the 4 P.M. and midnight shifts. For shift work performed on weekends the shift premium shall be fifty percent (50%) of wages and supplemental benefits. For shift work performed on holidays designated below, double time wages and supplemental benefits shall be paid. Also noted that the normal workday Monday through Friday 8:00 A.M. to 3:30 P.M. is not considered shift work, and therefore not subject to shift premium.

(Plumbers Local #1)

PLUMBER: PUMP & TANK

Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $75.00
Supplemental Benefit Rate per Hour: $35.81

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular workday (8:00 A.M. to 4:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER
(Exterior Building Renovation)

Journeyperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $66.58
Supplemental Benefit Rate per Hour: $33.85

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate. However, the employer may establish one (1) or two (2) shifts starting at or after 4:00 P.M. to be paid at the regular hourly rate plus a 10% differential. For projects bid and performed after July 1, 2023, the first shift shall be paid at the regular hourly rate plus a 5% differential.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $52.50
Supplemental Benefit Rate per Hour: $40.03

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential. There must be a first shift to work the second shift, and a second shift to work the third shift. All other work outside the regular work day (an eight hour workday between the hours of 5:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate.

(Local #8)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.08
Supplemental Benefit Rate per Hour: $60.70
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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.66
Supplemental Benefit Rate per Hour: $60.70

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $13.06

Overtime Description
Double time the regular rate after 10 hours on Saturday.

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
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
Juneteenth

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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $52.54
Supplemental Benefit Rate per Hour: $31.61
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime Description
Double time the regular rate after 10 hours on Saturday.

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
Juneteenth

Paid Holidays
None

(Local #28)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $33.06
Supplemental Benefit Rate per Hour: $3.04

Shipyard Mechanic - Second Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.89
Supplemental Benefit Rate per Hour: $2.26

Shipyard Laborer - First Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.74
Supplemental Benefit Rate per Hour: $3.28

Shipyard Laborer - Second Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.92
Supplemental Benefit Rate per Hour: $2.41

Shipyard Dockhand - First Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.65
Supplemental Benefit Rate per Hour: $3.27

Shipyard Dockhand - Second Class

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $20.78
Supplemental Benefit Rate per Hour: $3.20

Overtime Description

Work performed on holiday is paid double time the regular hourly wage rate plus holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Based on Survey Data

SIGN ERECTOR
(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $58.00
Supplemental Benefit Rate per Hour: $63.44

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $61.80
Supplemental Benefit Rate per Hour: $64.89
Supplemental Note: Overtime supplemental benefit rate for double time: $129.04. For time & half: $96.97

Steamfitter -Temporary Services

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.97
Supplemental Benefit Rate per Hour: $52.50

Overtime
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

The single time rate plus 15%.
Martin Luther King Jr. Day
President's Day
Columbus Day
Veteran's Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When shift work is
performed the wage rate for regular time worked is a 15% percent premium on wage.

Local 638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER
(Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.35
Supplemental Benefit Rate per Hour: $23.46

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.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day

Christmas Day

(Local #638-B)

STONE MASON - SETTER

Stone Mason - Setter

(Assisted by Derrickperson and Rigger)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $62.52
Supplemental Benefit Rate per Hour: $56.92

Overtime Description
Monday through Friday: Time and one quarter after seven hours worked. Time and one half after eight hours worked. Double time after 9 hours worked.
Saturday: Time and one half for the first nine hours worked. Double time after 9 hours worked.
Sunday and Holiday: double time for all hours worked.
Site Work: (paving and base course) paid at straight time for the first eight hours.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates
For all hours worked outside 8:00 am to 3:30 pm shall be paid double time unless flex band hours and/or site work are in use.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.01
Supplemental Benefit Rate per Hour: $37.67
Supplemental Note: Supplemental benefits for time and one half overtime - $42.80, For double overtime - $75.34

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Columbus Day
Thanksgiving Day
Day before Christmas
Christmas Day
Day before New Year's Day

(Local #1974)

TELECOMMUNICATION WORKER
(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects.)

Telecommunication Worker

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.03
Supplemental Benefit Rate per Hour: $23.15
Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. $22.84 for Staten Island only.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates

For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation

After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.
After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.93
Supplemental Benefit Rate per Hour: $34.66

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TILE LAYER - SETTER

Tile Layer - Setter

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $66.35
Supplemental Benefit Rate per Hour: $38.06

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $57.59
Supplemental Benefit Rate per Hour: $57.41

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate. Benefits for off-shift work shall be paid at the straight time rate.

(Local #1556)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $75.14
Supplemental Benefit Rate per Hour: $66.51

Tunnel Workers (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $72.46
Supplemental Benefit Rate per Hour: $64.41

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $71.24
Supplemental Benefit Rate per Hour: $63.14

Outside Lock Tender, Outside Gauge Tender,Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $69.83
Supplemental Benefit Rate per Hour: $62.11

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $69.83
Supplemental Benefit Rate per Hour: $62.11

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $61.57
Supplemental Benefit Rate per Hour: $58.18

Blasters (Free Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $71.69
Supplemental Benefit Rate per Hour: $63.84

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $68.58
Supplemental Benefit Rate per Hour: $61.18

All Others (Free Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $63.40
Supplemental Benefit Rate per Hour: $56.62

Microtunneling (Free Air Rates)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $54.86
Supplemental Benefit Rate per Hour: $48.95

Overtime Description

For work performed during excavation and primary concrete tunnel lining phases - Double time the regular rate after an 8 hour day and Saturday, Sunday and on the following holiday(s) listed below.
For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 8 hour day, Saturday, Sunday and double time the regular rate for work on the following holiday(s) listed below.
For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.
For work not listed above - Time and one half the regular rate after an 8 hour day and Saturday and double time the regular rate on Sunday and on the following holiday(s) listed below.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving

Christmas Day

(Local #147)

UTILITY LOCATOR
(Locate & mark underground utilities including gas for street excavation and utility line repairs)

Utility Locator (Months Over 60)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.03
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 55-60)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $35.83
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 49-54)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.07
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 43-48)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.30
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 37-42)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.54
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 31-36)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.78

Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 25-30)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.02
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 19-24)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.26
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 13-18)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 7-12)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $21.74
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Months 0-6)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.98
Supplemental Benefit Rate per Hour: $1.43
Supplemental Note: No Benefits for the first 90 days of employment.

Overtime

Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Shift Rates

10% shift differential to employees working any shift starting between noon and 5 AM.

Vacation

For up to 1 year 0 hours

For year 1 - 2 48 hours per year
For year 3 - 9 96 hours per year
For year 10 or more 144 hours per year

Sick Days:
For up to 1 year employee receives 40 hours paid sick leave.
For year 1 employee earns 2 hours of paid sick leave for every 100 overtime hours worked.
For year 2 - 9 years employee earns 4 hours of paid sick leave for every 100 overtime hours worked.
For year 10 or more employee earns 6 hours of paid sick leave for every 100 overtime hours worked.

(C.W.A.)

WELDER

WELDER AND FIREWATCH TO BE PAID AT THE RATE OF THE JOURNEYPERSON OR REGISTERED APPRENTICE IN THE TRADE PERFORMING THE WORK.

OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be paid at the apprentice rates in this schedule. Apprentices who are not so registered must be paid as journey persons in accordance with the trade classification of the work they actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

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BOILERMAKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.75
Supplemental Benefit Rate per Hour: $35.60

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.27
Supplemental Benefit Rate per Hour: $37.70

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $52.79
Supplemental Benefit Rate per Hour: $39.81

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $56.30
Supplemental Benefit Rate per Hour: $41.89

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $59.82
Supplemental Benefit Rate per Hour: $44.02

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $63.34
Supplemental Benefit Rate per Hour: $46.13

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $66.86
Supplemental Benefit Rate per Hour: $48.24

(Local #5)

BRICKLAYER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 650 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.52
Supplemental Benefit Rate per Hour: $29.85

Bricklayer (Second 650 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.65
Supplemental Benefit Rate per Hour: $29.85

Bricklayer (Third 650 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.77
Supplemental Benefit Rate per Hour: $29.85

Bricklayer (Fourth 650 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $42.90
Supplemental Benefit Rate per Hour: $29.85

Bricklayer (Fifth 650 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.03
Supplemental Benefit Rate per Hour: $29.85

Bricklayer (Last 750 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $55.16
Supplemental Benefit Rate per Hour: $29.85

(Bricklayer District Council)

CARPENTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour For Building Apprentice: $25.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $20.20

Wage Rate Per Hour For Heavy Apprentice: $28.98
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $39.89

Carpenter (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour For Building Apprentice: $28.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $21.70

Wage Rate Per Hour For Heavy Apprentice: $34.58
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $39.89

Carpenter (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour For Building Apprentice: $32.45
Supplemental Benefit Rate Per Hour For Building Apprentice: $25.30

Wage Rate Per Hour For Heavy Apprentice: $42.96
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $39.89

Carpenter (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour For Building Apprentice: $40.33
Supplemental Benefit Rate Per Hour For Building Apprentice: $27.30

Wage Rate Per Hour For Heavy Apprentice: $51.35
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $39.89

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

Carpenter - High Rise (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $18.27
Supplemental Benefit Rate per Hour: $17.55

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.70
Supplemental Benefit Rate per Hour: $17.68

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.28
Supplemental Benefit Rate per Hour: $17.81

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.90
Supplemental Benefit Rate per Hour: $17.96

(Carpenters District Council)

CEMENT AND CONCRETE WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.27
Supplemental Benefit Rate per Hour: $17.97

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: **$25.24**
Supplemental Benefit Rate per Hour: **$23.41**

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$31.21**
Supplemental Benefit Rate per Hour: **$24.85**

(Cement Concrete Workers District Council)

CEMENT MASON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$23.77**
Supplemental Benefit Rate per Hour: **$14.86**

Cement Mason (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$28.74**
Supplemental Benefit Rate per Hour: **$15.16**

Cement Mason (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$34.27**
Supplemental Benefit Rate per Hour: **$15.27**

(Local #780)

DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.91
Supplemental Benefit Rate per Hour: $31.63

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.27
Supplemental Benefit Rate per Hour: $47.63

Derrickperson & Rigger (stone) - Second Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.46
Supplemental Benefit Rate per Hour: $47.63

Derrickperson & Rigger (stone) - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $55.64
Supplemental Benefit Rate per Hour: $47.63

(Local #197)

DOCKBUILDER/PILE DRIVER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $28.98
Supplemental Benefit Rate Per Hour: $39.89

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $34.58
Supplemental Benefit Rate Per Hour: $39.89

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $42.96
Supplemental Benefit Rate Per Hour: $39.89

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $51.35
Supplemental Benefit Rate Per Hour: $39.89

(Carpenters District Council)

ELECTRICIAN
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician 1st year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $19.25
Supplemental Benefit Rate per Hour: $19.84
Overtime Supplemental Rate Per Hour: $21.11

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $19.25
Supplemental Benefit Rate per Hour: $20.93
Overtime Supplemental Rate Per Hour: $22.21

Electrician 2nd Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $21.25
Supplemental Benefit Rate per Hour: $20.88
Overtime Supplemental Rate Per Hour: $22.29

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $21.25
Supplemental Benefit Rate per Hour: $21.99
Overtime Supplemental Rate Per Hour: $23.40

Electrician 3rd Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $23.25
Supplemental Benefit Rate per Hour: $21.93

Overtime Supplemental Rate Per Hour: $23.48

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $23.25
Supplemental Benefit Rate per Hour: $23.05
Overtime Supplemental Rate Per Hour: $24.59

Electrician 4th Year

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $26.25
Supplemental Benefit Rate per Hour: $23.50
Overtime Supplemental Rate Per Hour: $25.25

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $26.25
Supplemental Benefit Rate per Hour: $24.64
Overtime Supplemental Rate Per Hour: $26.38

Electrician 5th Term (0-12 Months)

MIJ 1

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $26.79
Overtime Supplemental Rate Per Hour: $28.52

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $27.42
Overtime Supplemental Rate Per Hour: $29.16

Electrician 5th Term (13-18 Months)

MIJ 2

Effective Period: 7/1/2026 - 4/14/2027
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.01
Overtime Supplemental Rate Per Hour: $32.13

Effective Period: 4/15/2027 - 6/30/2027
Wage Rate per Hour: $33.50
Supplemental Benefit Rate per Hour: $30.68
Overtime Supplemental Rate Per Hour: $32.80

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: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $37.09
Supplemental Benefit Rate per Hour: $36.18

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $38.53
Supplemental Benefit Rate per Hour: $36.88

Elevator (Constructor) - Second Year

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $47.54
Supplemental Benefit Rate per Hour: $36.90

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $49.37
Supplemental Benefit Rate per Hour: $37.64

Elevator (Constructor) - Third Year

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $56.18
Supplemental Benefit Rate per Hour: $38.35

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $58.34
Supplemental Benefit Rate per Hour: $39.17

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $64.82

Supplemental Benefit Rate per Hour: $39.81

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $67.32
Supplemental Benefit Rate per Hour: $40.71

(Local #1)

ELEVATOR REPAIR & MAINTENANCE
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $37.09
Supplemental Benefit Rate per Hour: $36.15

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $38.53
Supplemental Benefit Rate per Hour: $36.85

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $37.43
Supplemental Benefit Rate per Hour: $36.87

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $38.90
Supplemental Benefit Rate per Hour: $37.61

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $44.24
Supplemental Benefit Rate per Hour: $38.32

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $45.97
Supplemental Benefit Rate per Hour: $39.14

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2026 - 3/16/2027
Wage Rate per Hour: $51.05
Supplemental Benefit Rate per Hour: $39.76

Effective Period: 3/17/2027 - 6/30/2027
Wage Rate per Hour: $53.04
Supplemental Benefit Rate per Hour: $40.66

(Local #1)

ENGINEER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.09
Supplemental Benefit Rate per Hour: $36.76

Engineer - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.36
Supplemental Benefit Rate per Hour: $36.76

Engineer - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.00
Supplemental Benefit Rate per Hour: $36.76

Engineer - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.63
Supplemental Benefit Rate per Hour: $36.76

(Local #15)

ENGINEER - OPERATING
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.96
Supplemental Benefit Rate per Hour: $29.90

Operating Engineer - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $48.70
Supplemental Benefit Rate per Hour: $29.90

Operating Engineer - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $58.44
Supplemental Benefit Rate per Hour: $29.90

(Local #14)

FLOOR COVERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $26.54
Supplemental Benefit Rate per Hour: $19.11

Floor Coverer (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.60
Supplemental Benefit Rate per Hour: $20.87

Floor Coverer (Third Year)

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: $34.05
Supplemental Benefit Rate per Hour: $24.87

Floor Coverer (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $42.40
Supplemental Benefit Rate per Hour: $27.12

(Carpenters District Council)

GLAZIER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.52
Supplemental Benefit Rate per Hour: $20.08

Glazier (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.41
Supplemental Benefit Rate per Hour: $35.41

Glazier (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.96
Supplemental Benefit Rate per Hour: $44.44

Glazier (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.42
Supplemental Benefit Rate per Hour: $49.97

DC9 (Local #1087)

HAZARDOUS MATERIAL HANDLER
(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Handler (First 1000 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $20.80
Supplemental Benefit Rate per Hour: $19.00

Handler (Second 1000 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $21.85
Supplemental Benefit Rate per Hour: $19.00

Handler (Third 1000 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.92
Supplemental Benefit Rate per Hour: $19.00

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.08
Supplemental Benefit Rate per Hour: $19.00

(Local #78)

HEAT & FROST INSULATOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.95
Supplemental Benefit Rate per Hour: $17.02

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.27
Supplemental Benefit Rate per Hour: $20.80

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $47.59
Supplemental Benefit Rate per Hour: $24.58

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $54.91
Supplemental Benefit Rate per Hour: $28.37

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.27
Supplemental Benefit Rate per Hour: $12.22

House Wrecker - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.02
Supplemental Benefit Rate per Hour: $12.22

House Wrecker - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.52
Supplemental Benefit Rate per Hour: $12.22

House Wrecker - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.02
Supplemental Benefit Rate per Hour: $12.22

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.98
Supplemental Benefit Rate per Hour: $15.99

Iron Worker (Ornamental) - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.45
Supplemental Benefit Rate per Hour: $17.99

Iron Worker (Ornamental) - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.80
Supplemental Benefit Rate per Hour: $18.99

Iron Worker (Ornamental) - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.39
Supplemental Benefit Rate per Hour: $20.99

(Local #580)

IRON WORKER - STRUCTURAL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.87
Supplemental Benefit Rate per Hour: $65.75

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.47
Supplemental Benefit Rate per Hour: $65.75

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.08
Supplemental Benefit Rate per Hour: $65.75

(Local #40 and #361)

LABORER - HEAVY & HIGHWAY
(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer - Heavy & Highway - First 1000 hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.30
Supplemental Benefit Rate per Hour: $57.77

Laborer - Heavy & Highway - Second 1000 hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.96
Supplemental Benefit Rate per Hour: $57.77

Laborer - Heavy & Highway - Third 1000 hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.95
Supplemental Benefit Rate per Hour: $57.77

Laborer - Heavy & Highway - Fourth 1000 hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $41.94
Supplemental Benefit Rate per Hour: $57.77

(Local #731)

LABORER - PAVER & ROADBUILDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.86
Supplemental Benefit Rate per Hour: $28.87

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.50
Supplemental Benefit Rate per Hour: $28.87

(Local#1010)

LABORER - PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - Line Striping (Roadway) - First Year (Minimum 1000 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.86
Supplemental Benefit Rate per Hour: $25.77

Paver and Roadbuilder - Line Striping (Roadway) - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.50
Supplemental Benefit Rate per Hour: $25.77

(Local #1010)

MARBLE MECHANICS
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - 0-3000 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $25.39
Supplemental Benefit Rate per Hour: $30.18
NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $26.35
Supplemental Benefit Rate per Hour: $29.52
NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - 3001-3750 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $38.07
Supplemental Benefit Rate per Hour: $34.03

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $39.51
Supplemental Benefit Rate per Hour: $33.04

Cutters & Setters - 3751-4500 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $41.24
Supplemental Benefit Rate per Hour: $34.99

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $42.80
Supplemental Benefit Rate per Hour: $33.92

Cutters & Setters - 4501-5250 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $44.41
Supplemental Benefit Rate per Hour: $35.96

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $46.09
Supplemental Benefit Rate per Hour: $34.80

Cutters & Setters - 5251-6000 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $47.58
Supplemental Benefit Rate per Hour: $36.92

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $49.39
Supplemental Benefit Rate per Hour: $35.68

Cutters & Setters - 6001-7500 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $49.48
Supplemental Benefit Rate per Hour: $44.08

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $51.51
Supplemental Benefit Rate per Hour: $42.68

Finisher- 0-750 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $23.56
Supplemental Benefit Rate per Hour: $12.18

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $23.78
Supplemental Benefit Rate per Hour: $12.29

Finisher- 751-1500 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $24.20
Supplemental Benefit Rate per Hour: $12.68

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $24.43

Supplemental Benefit Rate per Hour: $12.79

Finisher- 1501-2250 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $24.83
Supplemental Benefit Rate per Hour: $13.18

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $25.07
Supplemental Benefit Rate per Hour: $13.30

Finisher- 2251-3000 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $25.46
Supplemental Benefit Rate per Hour: $13.68

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $25.70
Supplemental Benefit Rate per Hour: $13.81

Finisher- 3001-3750 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $26.41
Supplemental Benefit Rate per Hour: $14.43

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $26.65
Supplemental Benefit Rate per Hour: $14.57

Finisher- 3751-4500 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $27.68
Supplemental Benefit Rate per Hour: $15.43

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $27.93
Supplemental Benefit Rate per Hour: $15.58

Polisher- 0-900 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $33.84
Supplemental Benefit Rate per Hour: $30.90

Effective Period: 7/2/2026 - 6/30/2027

Wage Rate per Hour: $31.82
Supplemental Benefit Rate per Hour: $30.71

Polisher- 901-1800 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $38.68
Supplemental Benefit Rate per Hour: $31.32

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $36.37
Supplemental Benefit Rate per Hour: $31.12

Polisher- 1801-2700 Hours

Effective Period: 7/1/2026 - 7/1/2026
Wage Rate per Hour: $43.51
Supplemental Benefit Rate per Hour: $31.79

Effective Period: 7/2/2026 - 6/30/2027
Wage Rate per Hour: $40.91
Supplemental Benefit Rate per Hour: $31.55

(Local #7)

MASON TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.27
Supplemental Benefit Rate per Hour: $11.72

Mason Tender - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.02
Supplemental Benefit Rate per Hour: $11.72

Mason Tender - Third Year

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: **$25.52**
Supplemental Benefit Rate per Hour: **$11.72**

Mason Tender - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$28.02**
Supplemental Benefit Rate per Hour: **$11.72**

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender (Interior Demolition) - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$21.75**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$23.50**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$25.00**
Supplemental Benefit Rate per Hour: **$11.27**

Mason Tender (Interior Demolition) - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$27.50**
Supplemental Benefit Rate per Hour: **$11.27**

(Local #79)

METALLIC LATHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.55
Supplemental Benefit Rate per Hour: $17.87

Metallic Lather (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $17.92

Metallic Lather (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.00
Supplemental Benefit Rate per Hour: $16.92

Metallic Lather (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.00
Supplemental Benefit Rate per Hour: $16.92

(Local #46)

MILLWRIGHT
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $33.04
Supplemental Benefit Rate per Hour: $39.09

Millwright (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.89
Supplemental Benefit Rate per Hour: $42.79

Millwright (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $44.74
Supplemental Benefit Rate per Hour: $47.14

Millwright (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $56.44
Supplemental Benefit Rate per Hour: $53.90

(Local #740)

MOSAIC MECHANIC
Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4

Mosaic & Terrazzo Mechanic 0-1500

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.45
Supplemental Benefit Rate per Hour: $10.96

Mosaic & Terrazzo Mechanic 1501-3000

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.80
Supplemental Benefit Rate per Hour: $14.08

Mosaic & Terrazzo Mechanic 3001-3750

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.35
Supplemental Benefit Rate per Hour: $22.33

Mosaic & Terrazzo Mechanic 3751-4500

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: $39.00
Supplemental Benefit Rate per Hour: $31.70

Mosaic & Terrazzo Mechanic 4501-5250

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.56
Supplemental Benefit Rate per Hour: $33.67

Mosaic & Terrazzo Mechanic 5251-6000

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $51.05
Supplemental Benefit Rate per Hour: $37.71

(Local 7)

PAINTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $18.20
Supplemental Benefit Rate per Hour: $20.34

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.76
Supplemental Benefit Rate per Hour: $25.91

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $27.30
Supplemental Benefit Rate per Hour: $30.60

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.40

Supplemental Benefit Rate per Hour: $39.74

(District Council of Painters)

PAINTER - BRIDGE & STRUCTURAL STEEL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Bridge & Structural Steel (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.80
Supplemental Benefit Rate per Hour: $18.53

Painter - Bridge & Structural Steel (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.20
Supplemental Benefit Rate per Hour: $34.29

Painter - Bridge & Structural Steel (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.60
Supplemental Benefit Rate per Hour: $45.76

(Local #806)

PAINTER - METAL POLISHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $20.17
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $20.56
Scaffold Over 34 Feet - Wage Rate Per Hour: $22.67

Metal Polisher (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.18
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $22.62
Scaffold Over 34 Feet - Wage Rate Per Hour: $24.68

Metal Polisher (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.20
Supplemental Benefit Rate per Hour: $8.91
New Construction - Wage Rate Per Hour: $24.74
Scaffold Over 34 Feet - Wage Rate Per Hour: $26.70

(Local 8A-28)

PLASTERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)
(Each Term is 800 Hours.)
(Rates are based of the Plasterer II)

Plasterer - First Term

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.15
Supplemental Benefit Rate per Hour: $12.98

Plasterer - Second Term

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.54
Supplemental Benefit Rate per Hour: $13.47

Plasterer - Third Term

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.95
Supplemental Benefit Rate per Hour: $14.12

(Local #262)

PLASTERER - TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer Tender - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.27
Supplemental Benefit Rate per Hour: $11.72

Plasterer Tender - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.02
Supplemental Benefit Rate per Hour: $11.72

Plasterer Tender - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.52
Supplemental Benefit Rate per Hour: $11.72

Plasterer Tender - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.02
Supplemental Benefit Rate per Hour: $11.72

(Local #79)

PLUMBER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.00

Supplemental Benefit Rate per Hour: $5.43

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $6.43

Plumber - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.78
Supplemental Benefit Rate per Hour: $24.44

Plumber - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $33.88
Supplemental Benefit Rate per Hour: $24.44

Plumber - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $36.73
Supplemental Benefit Rate per Hour: $24.44

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $38.13
Supplemental Benefit Rate per Hour: $24.44

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $50.20
Supplemental Benefit Rate per Hour: $24.44

(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: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.96
Supplemental Benefit Rate per Hour: $15.65

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.69
Supplemental Benefit Rate per Hour: $21.00

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.12
Supplemental Benefit Rate per Hour: $24.75

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $55.30
Supplemental Benefit Rate per Hour: $25.75

(Bricklayer District Council)

ROOFER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.95
Supplemental Benefit Rate per Hour: $8.06

Roofer - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.63

Supplemental Benefit Rate per Hour: $18.39

Roofer - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $26.25
Supplemental Benefit Rate per Hour: $20.35

Roofer - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.50
Supplemental Benefit Rate per Hour: $24.28

Roofer - Fifth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.38
Supplemental Benefit Rate per Hour: $30.20

(Local #8)

SHEET METAL WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.57
Supplemental Benefit Rate per Hour: $8.26

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $19.84
Supplemental Benefit Rate per Hour: $22.30

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $25.57
Supplemental Benefit Rate per Hour: $30.13

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.31
Supplemental Benefit Rate per Hour: $35.67

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.31
Supplemental Benefit Rate per Hour: $35.67

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.93
Supplemental Benefit Rate per Hour: $44.01

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.93
Supplemental Benefit Rate per Hour: $44.01

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $45.64
Supplemental Benefit Rate per Hour: $49.58

(Local #28)

SIGN ERECTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $20.30
Supplemental Benefit Rate per Hour: $18.25

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.20
Supplemental Benefit Rate per Hour: $20.68

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $26.10
Supplemental Benefit Rate per Hour: $23.14

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.00
Supplemental Benefit Rate per Hour: $25.61

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $31.90
Supplemental Benefit Rate per Hour: $34.50

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.80
Supplemental Benefit Rate per Hour: $37.54

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $37.70
Supplemental Benefit Rate per Hour: $41.43

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.60
Supplemental Benefit Rate per Hour: $44.55

Sign Erector - Fifth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.50
Supplemental Benefit Rate per Hour: $47.68

Sign Erector - Sixth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.40
Supplemental Benefit Rate per Hour: $50.78

(Local #137)

STEAMFITTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.72
Supplemental Benefit Rate per Hour: $26.40

Steamfitter - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $30.90
Supplemental Benefit Rate per Hour: $32.82

Steamfitter - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $37.08
Supplemental Benefit Rate per Hour: $39.23

Steamfitter - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $43.26
Supplemental Benefit Rate per Hour: $45.65

Steamfitter - Fifth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $49.44
Supplemental Benefit Rate per Hour: $52.06

(Local #638)

STEAMFITTER - REFRIGERATION & AIR CONDITIONER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Refrigeration & Air Conditioner (First Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.39
Supplemental Benefit Rate per Hour: $15.35

Refrigeration & Air Conditioner (Second Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.25
Supplemental Benefit Rate per Hour: $16.91

Refrigeration & Air Conditioner (Third Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $32.91
Supplemental Benefit Rate per Hour: $18.53

Refrigeration & Air Conditioner (Fourth Year)

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.75
Supplemental Benefit Rate per Hour: $20.73

(Local #638-B)

STONE MASON - SETTER
(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.41
Supplemental Benefit Rate per Hour: $23.93

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.26
Supplemental Benefit Rate per Hour: $32.93

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $34.85
Supplemental Benefit Rate per Hour: $32.93

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $40.44
Supplemental Benefit Rate per Hour: $32.93

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $46.04
Supplemental Benefit Rate per Hour: $32.93

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $51.63
Supplemental Benefit Rate per Hour: $32.93

(Bricklayers District Council)

TAPER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $22.96
Supplemental Benefit Rate per Hour: $15.55

Drywall Taper - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $24.51
Supplemental Benefit Rate per Hour: $26.61

Drywall Taper - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $29.41
Supplemental Benefit Rate per Hour: $28.82

Drywall Taper - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $39.21
Supplemental Benefit Rate per Hour: $33.24

(Local #1974)

TILE LAYER - SETTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $23.09
Supplemental Benefit Rate per Hour: $13.45

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $28.32
Supplemental Benefit Rate per Hour: $13.45

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: $35.65
Supplemental Benefit Rate per Hour: $16.56

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027

Wage Rate per Hour: **$40.86**
Supplemental Benefit Rate per Hour: **$16.56**

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$44.67**
Supplemental Benefit Rate per Hour: **$17.98**

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$48.38**
Supplemental Benefit Rate per Hour: **$19.48**

Tile Layer - Setter - Seventh 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$52.23**
Supplemental Benefit Rate per Hour: **$20.86**

Tile Layer - Setter - Eighth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$57.45**
Supplemental Benefit Rate per Hour: **$20.86**

Tile Layer - Setter - Ninth 750 Hours

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate per Hour: **$59.83**
Supplemental Benefit Rate per Hour: **$23.71**

(Local #7)

TIMBERPERSON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $26.96
Supplemental Rate Per Hour: $39.69

Timberperson - Second Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $32.07
Supplemental Rate Per Hour: $39.69

Timberperson - Third Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $39.72
Supplemental Rate Per Hour: $39.69

Timberperson - Fourth Year

Effective Period: 7/1/2026 - 6/30/2027
Wage Rate Per Hour: $47.38
Supplemental Rate Per Hour: $39.69

(Local #1536)

SPECIFICATIONS

CONTRACT GI-CONS-7
SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.1 REQUIREMENTS

A. This Specification includes a summary of the Project requirements and description of Work to be performed by the Contractor for On-Site Green Infrastructure (GI) Practice installations for the New York City Department of Environmental Protection.

B. Definitions

1. **On-Site –** refers to the work performed for DEP on properties owned and/or managed by NYC Parks and other City agencies, with minimal - work, if any, performed in the public right of way.

2. **Bioretention Practice –** an area that is excavated and backfilled with stone that is wrapped in geotextile. The geotextile-wrapped stone will be backfilled with engineered soils for final surface restoration and plantings as required on the Contract Drawings. The stone layer may contain a HDPE stormwater chamber or HDPE Perforated Pipe for additional storage, and an HDPE perforated pipe to act as an underdrain that connects to the stormwater collection system. The Bioretention Practice will be provided with cleanouts to facilitate maintenance. The Contractor is directed to the Contract Drawings for further details.

3. **Permeable Surface Practice –** a paving surface that allows water to enter into the bedding layer through the sand or stone bedding between the pavers. Below the stone or sand bedding is a larger stone bedding layer, often with HDPE underdrain piping to provide a connection to the stormwater collection system. The Permeable Surface Practice typically has cleanouts to facilitate maintenance. The Contractor is directed to the Contract Drawings for further details.

4. **Porous Surface Practice** – a paving surface that allows water to enter into the bedding layer through void spaces in the surface paving material. Below the paving material is a stone bedding layer, often with HDPE underdrain piping to provide a connection to the stormwater collection system. The Porous Surface Practice typically has cleanouts to facilitate maintenance. The Contractor is directed to the Contract Drawings for further details.

5. **Subsurface Retention/Detention Practice** – an area that is excavated, backfilled with stone that is wrapped in geotextile and/or impermeable liner, and which may surround High Density Polyethylene (HDPE) Stormwater Chambers, Precast Concrete Chambers, HDPE Perforated Pipe, or other HDPE stormwater storage modules. The geotextile and/or impermeable liner-wrapped stone will be backfilled with clean fill for final surface restoration as shown on the Contract Drawings. The Subsurface Retention/Detention Practice will be connected to the stormwater collection system and will be provided with cleanouts to facilitate maintenance. The Contractor is directed to the Contract Drawings for further details.

6. **Synthetic Turf Field Practice** – a synthetic surface system overlaying a stone bed, typically with a series of HDPE perforated pipes located in the stone bedding layer. The Synthetic Turf Field Practice will have an underdrain that is connected to the stormwater collection system and will be provided with trench drains surrounding the field with sumps and cleanouts on the piping to facilitate maintenance. The Contractor is directed to the Contract Drawings for further details.

7. **On-Site Green Infrastructure Practice** – a system installed On-Site at an existing facility in order to capture and manage stormwater. An On-Site Green Infrastructure (OS GI) Practice refers to a Bioretention Practice, Permeable Surface Practice, Porous Surface Practice, Subsurface Retention/Detention Practice, and a Synthetic Turf Field Practice.

8. **Pervious Pavements** – is a general term used to describe a range of materials and techniques, such as permeable pavers, porous concrete, and porous asphalt that allows water to infiltrate between or through the paving materials to a broken stone base layer and ultimately infiltrate into the existing subsoil.

9. **Ponding & Flow Inspection –** an inspection required to be performed by the Contractor to ensure newly installed asphalt and porous pavement do not allow for ponding and surface flow enters inlets and porous materials as designed. The inspection shall occur 30 minutes after a rainfall event of at least 0.25 inches or through controlled clean water application covering the full surface. Water shall be provided by the contractor if inspection during a rainfall event is not feasible.
   i. Areas of standing water will be visually inspected and marked. Any ponding depth greater than 1/16 inch shall be considered a ponding depth and corrected to ensure positive drainage. Any persistent water accumulation, regardless of depth in areas intended for active play (i.e. basketball, pickleball, playgrounds) shall be corrected to ensure positive drainage.
   ii. Site grading and flow shall be inspected, verifying the site inlets capture the water as intended without bypass, meeting the required lines, grades, and typical cross sections shown on the Contract Drawings. Should inlets or catch basins not capture all of the design flow (i.e. the inlet is set too high or asphalt does not pitch to the inlet) the contractor shall provide corrective measures to the satisfaction of DEP.
   iii. Porous asphalt shall be tested and inspected per Section 32 12 19.19 Porous Asphalt.
   iv. Ponding and flow inspections and corrections are not a separate pay item. All work and materials required to meet these requirements shall be included in the Contract unit prices for asphalt paving and/or porous pavement. All ponding areas shall be corrected to the Engineer's satisfaction prior to final acceptance.

C. Minimum Qualifications

1. Contractor's Superintendent

The Contractor shall employ and retain at the site of the Work, from the commencement until the completion of the Work, a superintendent competent and capable of maintaining proper supervision and care of the Work, and who, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any Subcontractor, shall carry out the directions of the Engineer. Contractor shall submit Superintendent's experience in the supervision of similar work proposed in this Contract for DEP's approval.

D. Datum

1. Unless indicated otherwise, elevations indicated or specified refer to the North America Vertical Datum of 1988 ("NAVD 88") for vertical data.
2. Unless indicated otherwise, coordinates indicated or specified refer to the North American Datum ("NAD 83") State Plane New York, Long Island FIPS 3104 Feet for horizontal data.

E. Work to Proceed with Diligence and Dispatch

1. The Contract Documents identifies work priorities and milestone events to permit satisfactory completion of the Work within the times fixed herein.
   a. Refer to Section 01 14 00 – Work Restrictions for details regarding project working hours.
2. The Contractor is required to prepare a Progress Schedule in accordance with the requirements of Section 01 32 10 – Progress Schedule. Any and all schedules provided by DEP are to be considered preliminary and are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete.
3. The Contractor shall assume all responsibility for estimates of the size, kind and quality of materials and equipment included in Work.
4. The Contractor shall deliver materials in ample quantities to ensure speedy and uninterrupted progress of the Work in order to complete the Work by the date of Substantial Completion.
5. The Contractor must provide a minimum of two self-sustaining work crews that are each simultaneously capable of completing a GI asset from excavation through hardscape at the start of construction. The Engineer shall periodically assess the rate of progress and may order the Contractor to mobilize additional work crews to complete the work on time.

1.2 RELATED SECTIONS

A. Section 01 14 00 – Work Restrictions

B. Section 01 32 10 – Progress Schedule

C. Section 01 33 00 – Submittal Procedures

D. Section 01 78 39 – Final Record Documents

1.3 PAYMENT

A. There will be no separate payment for the Work specified herein.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. NYC DEP BWSO Standard Sewer and Water Main Specifications:

https://www1.nyc.gov/assets/ddc/downloads/publications/infrastructure/sewer_and_water main_std_specs_14-07-01.pdf

B. NYCDOT Standard Highway Specifications:

Volume 1:
http://www1.nyc.gov/assets/ddc/downloads/publications/infrastructure/Standard%20Highway%20Specs%20August%201%202015%20Vol%201.pdf

Volume 2:
http://www1.nyc.gov/assets/ddc/downloads/publications/infrastructure/Standard%20Highway%20Specs%20August%201%202015%20Vol%202.pdf

C. NYC Parks Standard Details

Contractor shall refer to the Contract Documents for NYC Parks Standard Details.

D. Code and Industry Standard References

When reference is made to the standards of any technical society, organization, or body, it shall be construed to mean the latest standard, code, specification, or tentative specification adopted and published. Governing federal, State, and local law shall always control in the event of a conflict. When no reference is made to a code, standard or specification, the standards of the ASTM or AIEE shall govern.

ABBREVIATIONS: Reference to the technical society, organization or body may be made in the Specifications in accordance with the following lists:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers

ASTM Des.	American Society for Testing Materials Designation
AWSC	American Welding Society Code
AWWA	American Water Works Association
BS&A	New York City Board of Standards & Appeals
CIPRA	Cast Iron Pipe Research Association
DCAS*	Dept. of Citywide Administrative Services (NYC)
DEP	Dept. Of Environmental Protection (NYC)
FED. SPEC.	Federal Specifications
NAVY Spec.	Navy Department Specification
NEMA	National Electrical Manufacturers Association
NYBC	New York City Building Construction Code
	(f/k/a New York City Building Code)
NYC Parks	New York City Dept. of Parks and Recreation
NYEC	New York City Electrical Code
N.Y. Spec.*	New York City Dept. for Purchase Specifications

* These Specifications may be viewed or obtained free of charge at the Office of Vendor Relations, Municipal Building, 1 Centre Street, 18th Floor, NY, NY (212) 669-8562.

1.5 REGULATORY COMPLIANCE

A. Local Laws.

All materials, appliances and types or methods of construction must be in accordance with the Specifications and must not be less than what is necessary to conform to the requirements of the Administrative Code and the Charter of the City of New York.

The New York City Construction Codes (set forth in Title 28 of the New York City Administrative Code, as amended) ("Code" or "Codes") shall be considered a part of these specifications and all provisions of the Code which may apply to the work of this Contract are part of these specifications as if repeated in full herein and shall be preferred to any provisions herein which may conflict.

B. Fire Prevention Control

The Contractor shall comply with the safety provisions of the National Fire Protection Association's "National Fire Codes" and the New York City Fire Codes that pertain to the Work and, particularly, in connection with any cutting or welding performed as part of the Work.

1.6 SUBMITTALS

A. Submittal and approval of Contractor's Shop Drawings and furnishing Final Record Documents, shall be as specified in the following sections of the Contract:

1. Section 01 33 00 – Submittal Procedures

2. Section 01 78 39 – Final Record Documents

PART 2 PRODUCTS

2.1 APPROVAL OF "OR EQUAL" MATERIAL

A. Whenever an article, material, apparatus, equipment, or process is specified by a trade name or by the name of a patentee, manufacturer or dealer, or by reference to the catalogue of a manufacturer or dealer, it shall be taken as intending to mean and specify the article, material, apparatus, equipment, or process designated, or any other equal thereto in quality, finish and durability and equally serviceable for the purposes for which it is or they are intended.

B. Where the Contractor proposes an alternate to a specific manufacturer's material or equipment named in the Specifications that is believed to be equal to that specified, proof that the material and/or equipment offered as an alternate is equal in construction,

function and efficiency to that named in the Specifications shall be furnished by the Contractor to the Engineer for approval. The proposed alternate may be used ONLY if it has been approved by the Engineer.

C. Any redesign required as a result of the approval of a proposed change shall also be submitted to the Engineer for approval. Once approved by the Engineer, the cost of such redesign shall be borne by the Contractor who proposed the alternate.

D. Any additional cost incurred as a result of the use of an approved alternate shall be borne by the Contractor.

E. No substitution or redesign is permitted unless the Contractor has obtained the prior written approval of the Engineer.

2.2 CONFLICTS

A. Bidders are cautioned to read carefully the Specifications and Drawings for all work included in this Contract. Bidders are responsible for ascertaining that the Specifications and Drawings have the correct number of pages. The prospective bidder must visit the site to ascertain the full nature and extent of the Work required.

B. Prior to commencing Work, the Contractor is responsible for verifying dimensions and existing conditions at the Site. The Contractor shall report to the Engineer any conditions that may prevent proper performance of work. The Contractor shall immediately notify the Engineer in writing of any discrepancies between the Contract Documents and field conditions that may affect the Work.

PART 3 EXECUTION

3.1 SUMMARY OF WORK

The capital project includes construction of green infrastructure at separate NYC project sites which includes the installation of subsurface detention / retention, bioretention, utility location via. test pits and drainage infrastructure located within the ROW as outlined and drawn in the construction documents, and listed in the table on the following page:

CONTRACT GI-CONS-7
SECTION 01 11 00
SUMMARY OF WORK

GI-CONS-7		
Location	**Jointly Operated Playground**	**Green Infrastructure Practice Type**
Fresh Meadows Park		SUBSURFACE STORAGE SYSTEM
Maurice A. Fitzgerald Playground		SUBSURFACE PERFORATED PIPE SYSTEM
Saul Weprin Playground	X	SUBSURFACE STORAGE SYSTEM
Sedgwick Dickinson		SUBSURFACE STORAGE SYSTEM W/ BIORETENTION
VCP Classic Playground		SUBSURFACE STORAGE SYSTEM
VCP E 233rd St Tennis Courts		SUBSURFACE STORAGE SYSTEM
Harding Park		BIORETENTION SYSTEM

3.2 GENERAL SCOPE OF WORK INCLUDED

A. All work related to BWSO water and sewer utilities will be inspected and approved by BWSO Construction Unit. All required documents shall be submitted to BWSO Construction Unit prior to the pre-construction meeting. Required documents are as follows, and as listed in the BWSO Pre-Construction Checklist:

1. Completed application form for permit to build.
2. Performance and Maintenance Bonds for the amount listed on the plan. *
3. Owner's insurance certificate for construction naming NYC DEP as additional insured. *
4. Contractor's insurance certificates for liability and worker's compensation construction naming NYC DEP as additional insured. *
5. Notarized Contract between owner and Contractor. *
6. Notarized Contract between owner and Resident (Supervising) Engineer from consulting firm. *
7. Resumes of Resident (Supervising) Engineer and Contractor indicating that they have successfully completed at least two Capital sewer construction projects.
8. List of vendors who will be supplying materials and services (including the company and the name, address, and phone number of the responsible person).
9. Detailed drawing for sheeting and bracing (with original signature and seal from a Professional Engineer / Registered Architect).
10. Original NYC DOT Street Opening Permit with restoration requirements and traffic stipulations.
11. A check for inspection fee, for the amount stated above the signature box of the approved plan, payable to the NYC Water Board.

* Please note the original and a copy are to be submitted.

B. Work under the Contract may also include furnishing the services of manufacturers' technical representatives for the installation of porous asphalt and subsurface practices

installed under the Contract for assistance in installation, and providing training of the operating maintenance.

C. The following is a general description of the Work under the Contract, and is not to be construed as a complete description of the Work to be performed.

1. Install temporary fencing.

2. Install approved sediment and erosion control measures at work location and adjacent downstream catch basins.

3. Conduct test pit investigations as called for on contact documents to locate / verify unknown utility information.

4. Saw cut and remove asphalt or other surface materials as required in the location of the On-Site Green Infrastructure Practice and associated drainage structures.

5. Excavate to required depth and provide structural support if necessary.

6. For subsurface retention practices, install stone base, storage chambers, and associated drainage piping and inlet and outlet structures.

7. Backfill chambers with stone base and wrap with geotextiles.

8. For bioretention practices, install stone base and underdrain as applicable. Wrap with geotextile and backfill with engineered soil.

9. Fully saturate On-Site Green Infrastructure Practice, allow water to drain down and fully saturate again in the presence of the Engineer and/or DEP representative.

10. Install asphalt and perform asphalt restoration work.

11. Perform a ponding and flow inspection after the final asphalt surface course has been placed and compacted and/or once porous pavement practices have been installed. See “Definitions” under Section 1.1, B of this Specification.

12. Install fencing and other perimeter treatments shown in the Contract Drawings.

13. Perform all concrete restoration work, including seal coating.

14. Perform all landscaping as shown on the Contract Drawings and as directed by the Engineer.

15. Remove unsuitable material off site.

16. Maintain site safety measures and erosion control measures throughout the course of the Work.

17. For porous pavement practices, install porous concrete panels, stone base, trench drains, and inline catch basins as applicable.

18. All other work required for the satisfactory completion of this Contract.

D. The Contractor shall do all Work and pay all costs of cutting, protecting, supporting, maintaining, relocating and restoring all surface, sub-surface, or overhead structures, and all other property, including pipes, conduits, ducts, tubes, chambers, and appurtenances, in the vicinity and at the site of the Work (except such which by law, franchise, permit, contract, consent or agreement the owner thereof is required to protect, support, maintain, relocate or restore), repairing the same if damaged and restoring to their original condition all areas disturbed.

E. Cutting and restoration. Prior to cutting existing work, the Contractor must submit the location, size of cut and method of cutting to the Engineer for approval, and any adjacent work must not be damaged. Upon completion of the cutting, all affected areas must be restored satisfactorily by the Contractor.

3.3 LICENSED PLUMBER REQUIREMENTS

A. Any person performing plumbing work on this Project must be a licensed master plumber ("Master Plumber") as defined in the New York City Construction Codes, or working under the direct and continuing supervision of a Master Plumber, either personally or through one to three levels of competent supervision over individuals performing the actual Master Plumber trade work who are: (a) in the direct employ of an individual who is a Master Plumber; (b) in the direct employ of a plumbing business employing the Master Plumber licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes; (c) in the direct employ of a plumbing business where one (1) or more Master Plumbers uses his(her) license on behalf of such business, provided that such business is properly disclosed to the New York City Department of Buildings pursuant to New York City Construction Codes.

B. Unless the Contractor is a Master Plumber or plumbing business properly employing such licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes, the Contractor shall subcontract all plumbing work to such a Master Plumber or plumbing business properly employing such licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes. Copies of a valid Master Plumber license issued by the New York City Department of Buildings to such Master Plumber or Master Plumber licensee(s) affiliated with such business shall be made available to the Department for inspection upon its request.

3.4 LICENSED ELECTRICIAN REQUIREMENTS

A. Any person performing electrical work on this Project must be a licensed master electrician ("Master Electrician") as defined in the New York City Construction Codes, or working under the direct and continuing supervision of a Master Electrician, either personally or through one to three levels of competent supervision over individuals performing the actual Master Electrician trade work who are: (a) in the direct employ of an individual who is a

Master Electrician; or (b) in the direct employ of an electrical business employing the

Master Electrician licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes; or (c) in the direct employ of an electrical business where one (1) or more Master Electricians uses his(her) license on behalf of such business, provided that such business is properly disclosed to the New York City Department of Buildings pursuant to New York City Construction Codes.

B. Unless the Contractor is a Master Electrician or an electrical business properly employing such licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes, the Contractor shall subcontract all electrical work to such a Master Electrician or an electrical business properly employing such licensee(s) in accordance with the limitations and requirements set forth for such business in the New York City Construction Codes. Copies of a valid Master Electrician license issued by the New York City Department of Buildings to such Master Electrician or Master Electrician licensee(s) affiliated with such business shall be made available to the Department for inspection upon its request.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 14 00
WORK RESTRICTIONS

PART 1 GENERAL

1.01 REQUIREMENTS (NOT USED)

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 11 00 – Summary of Work

B. Section 01 32 10 – Progress Schedule

C. Section 01 41 00 – Regulatory Requirements

D. Section 01 56 00 – Temporary Barriers and Enclosures

E. Section 01 57 16 – Temporary Pest Control

F. Section 01 74 17 – Cleaning and Site Maintenance

G. Section 01 74 20 – Construction Waste Management

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Administrative Code

B. New York City Noise Control Code

C. DEP Standards for Green Infrastructure

D. NYC DEP BWSO Standard Sewer and Water Main Specifications

E. NYCDOT Standard Highway Specifications

F. Rules and Regulations of the New York City Department of Parks and Recreation

G. United States Department of Housing and Urban Development (HUD)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

CONTRACT GI-CONS-7
SECTION 01 14 00
WORK RESTRICTIONS

A. The Contractor shall develop plans for the following and submit them in accordance with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 01 33 00 – Submittal Procedures.

1. Proposed location for material and equipment storage

2. Noise Reduction Plan

3. Quality of Life Compliance Plan

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION OF PREMISIS (NOT USED)

3.02 TEMPORARY STRUCTURES

A. Land for Contractor's use. There is no land dedicated for use by the Contractor for storage. The Contractor shall propose to the Engineer for review and approval a plan for use of an off-site location or a portion of the Site to be used by the Contractor for storage. Upon approval, the Contractor shall obtain all permits or approvals as required.

B. Obstructions, access. The Contractor shall not obstruct any access to the property except as shown on the Contract Drawings. The necessary facilities and safeguards to comply with this requirement shall be provided and maintained at the expense of the Contractor. 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 other contractor, the Contractor shall remove and restack such materials at no additional cost to the City.

C. Trespassing prohibited. All employees and Subcontractors are prohibited from trespassing on private or public property except where the law permits such entrance for the purpose of underpinning or otherwise protecting adjoining structures. The Contractor shall give ample notice to the owners and users of all such structures before disturbing or using them.

3.03 PROJECT WORKING HOURS

A. “Normal Project Working Hours” for this Contract are between the hours 7 AM through 5 PM, Monday through Friday (except for holidays) for New York City Parks and Recreation sites. “Normal Project Working Hours” for Jointly Operated Playgrounds (JOP) sites are between the hours 9 AM through 6 PM, Monday through Friday (except for holidays), with additional restrictions noted in Section 3.08 herein. If Work is scheduled to be performed beyond the Normal Project Working Hours, the Engineer shall be informed a minimum of 5 business days and will require NYC Parks approval in advance of the beginning of such Work. to the Contractor shall adhere to all applicable laws, rules and regulations that may

govern or restrict the performance of the Work, including, but not limited to, the noise abatement provisions of Section 24-216 (b) of the Administrative Code of the City of New York ("Administrative Code"). “Normal Project Working Hours” are provided for reference only herein and within Contract Drawings. Hours may vary based on the requirements of the property owner, adjacent property owner, and/or regulating agencies. Further restrictions may be included in the Contract Drawings.

B. The Contractor will make no claim for extra compensation solely because of additional costs, including any premium time (second shifts or scheduled overtime), to meet the scheduled dates.

C. If the Contractor fails to adhere to the Project schedule the Contractor shall promptly adopt measures as the Engineer deems necessary, appropriate, and adequate to recover any lost time. The Engineer may also direct the Contractor to propose corrective measures for consideration (without any obligation by DEP to adopt the same). Such corrective measures shall be incorporated into the Construction Progress Schedule and submitted to the Engineer in accordance with the requirements of DEP Standard Specification for On-Site Green Infrastructure Section 01 32 10 – Progress Schedule.

3.04 COMPLIANCE WITH REGULATORY REQUIREMENTS

A. The Contractor shall be responsible for securing all required approvals in a timely manner so as not to delay the Work. Refer also to DEP Standard Specification for On-Site Green Infrastructure Section 01 41 00 – Regulatory Requirements and DEP Standard Specification for On-Site Green Infrastructure Section 01 11 00 – Summary of Work.

B. Emission Control Technology for Non-Road Vehicles. The Contractor shall complete and submit to the Engineer the attached Local Law 77: DEP Monthly Reporting Forms (Exhibit A, attached to this Section) to report on usage of Ultra Low Sulfur Diesel (ULSD) fuel and Best Available Technology in diesel-powered non-road vehicles for reducing emission of pollutants on a monthly basis.

C. Vehicle Idling Time. Idling time shall be limited to three consecutive minutes for all delivery, concrete and materials trucks as well as other diesel-powered equipment (hereinafter referred to as a mobile source) except as follows:

1. When a mobile source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.

2. When it is necessary to operate heating, cooling or auxiliary equipment installed on the mobile source when such equipment is necessary to accomplish the intended use of the mobile source.

3. To bring the mobile source to the manufacturer’s recommended operating temperature.

4. When the outdoor temperature is below twenty (20) degrees Fahrenheit.

5. When the mobile source is being repaired.

6. The Contractor shall meet the requirements of Section 24-163(f) of the NYC Administrative Code, regarding vehicle idling time adjacent to schools.

D. City Fleet and Truck Safety. The Contractor shall comply with New York City Executive Order No. 39 of 2024 (EO 39). The Contractor shall submit to the Engineer a Fleet Safety Plan, as required by EO39.

3.05 COMPLIANCE WITH QUALITY OF LIFE REQUIREMENTS

A. The Contractor is strongly advised that DEP regards the preservation of "quality of life" as a high priority for the community near all DEP construction projects. The Contractor, therefore, will be held to the strictest account in its adherence to Contract requirements and all applicable laws, rules, and regulations that relate to "quality of life." These include noise control, dust control, particulate control, pest control, rodent control, cleanliness and maintenance of the Site and surrounding areas, adherence to traffic and parking regulations, emissions control for non-road vehicles and emissions control for on-road vehicles. Refer also to DEP Standard Specification for On-Site Green Infrastructure Section 01 57 16 – Temporary Pest Control and DEP Standard Specification for On-Site Green Infrastructure Section 01 74 17 – Cleaning and Site Maintenance.

1. The Contractor shall submit a "Quality of Life" compliance plan for review and approval by the Engineer. This plan shall address all Work required by the Contractor to satisfy the "quality of life" requirements.

2. Work at the Site(s) shall not commence until the Engineer approves the Contractor's Quality of Life compliance plan.

3. When the Contractor is determined to be noncompliant with Quality of Life requirements, as described in the paragraph above, the Contractor shall be subject to the following measures:

   a. Where non-compliance with a "Quality of Life" requirement is not corrected within a timeframe specified by the City, Work may be ordered to stop until such measures as the City deems satisfactory are taken to resolve the problem and prevent future occurrence. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for additional costs or damages by the Contractor.

4. The Contractor shall cooperate fully with the Engineer to prevent, address and resolve any and all "Quality of Life" issues, which may arise from time to time, by whatever means necessary, all at no additional cost to the City.

5. The Contractor record of compliance with "Quality of Life" requirements for this project and its efforts to coordinate with the Engineer and comply with his/her directions in this regard will be reflected in the Contractor's Evaluation. This Evaluation will become a part of the Contractor's record of doing business with

the City of New York and may affect the Contractor's ability to be awarded future projects.

B. The Contractor shall abide by all federal, State, and local laws, rules and regulations governing the performance of the Work, throughout the entire Contract term. The Contractor shall provide a Noise Reduction Plan to the Resident Engineer and shall take every precaution to minimize noise generated by construction activities. Sound attenuation blankets and/or barriers shall be installed and equipment will be selected to reduce noise levels as necessary or as directed by the Engineer. The Contractor is advised that strict adherence to the New York City Noise Code is mandatory and that no deviation(s) from that Code are permitted without the Contractor's procurement of any required variance(s).

3.06 COORDINATION WITH THE NEW YORK CITY DEPARTMENT OF PARKS AND RECREATION (NYCDPR)

A. Employee Identification

The Contractor shall provide for its personnel working on the Project sites means of identification such as a T-shirt or hat in addition to a photo identification tag that identifies him or her as an employee of the Contractor. The Contractor shall require personnel to use identification tags at all times. Employees not properly displaying the required identification shall not be allowed to perform Work on NYCDPR property.

B. On-Site Work Hours

Daily on-site working hours are 7AM – 5PM Monday through Friday, to be confirmed with the individual NYCDPR facility manager of each Site. The Contractor shall obtain approval, in writing, from NYCDPR's Representative and the Engineer for any Work that to be performed outside of Normal Project Working Hours.

C. Access to Site

1. General: Contractor shall have limited use of the Project Sites for construction operations, as indicated on the Contract Documents.

2. Use of Sites: Limit use of Project Sites to Work in areas indicated on Contract Drawings. Do not disturb portions of the Project Site beyond areas in which the Work is indicated.

3. Access to the Sites shall be as directed by NYCDPR and is fully subject to NYCDPR's approval.

D. Coordination with NYCDPR

With the exception of active Work areas as permitted by NYCDPR, NYCDPR will occupy the Project Sites and existing buildings during the entire construction period. The Contractor shall plan and coordinate its operations with NYCDPR and NYCDPR's

Representative in a timely fashion so as to minimize delays in construction as well as interference with Park activities.

1. The Contractor shall maintain access to existing walkways, entrances, paths, and other adjacent facilities. The Contractor shall not close or obstruct walkways, entrances, paths, or other occupied or used areas of the Project sites without prior written permission from NYCDPR or approval of any other authorities having jurisdiction.

2. The Contractor shall notify NYCDPR not less than 2-weeks in advance of activities that may affect NYCDPR's operations.

3. The Contractor shall be responsible to clean all areas of Work on a daily basis to the complete satisfaction of the Engineer.

E. Existing Utility Interruptions

1. The Contractor shall not interrupt existing utilities without completing the following conditions:

   a. Notify the Resident Engineer and NYCDPR's Representative not less than 2-weeks in advance of proposed utility interruptions.

   b. Obtain the written permission of NYCDPR's Representative before proceeding with utility interruptions.

   c. Except as otherwise expressly provided in the Contract, the Contractor shall submit to the NYCDPR's Representative, for approval, a proposed schedule of all utility shutdowns and cutovers of all types which may be required in connection with the Work. Such a schedule shall provide a minimum of two (2) weeks advance notice to NYCDPR prior to the item of the proposed shutdown or cutover.

F. Concessions On-Site

No restaurants, lunchrooms or other concessions of any kind whatsoever shall be operated on Project Site.

3.07 COORDINATION WITH NEW YORK CITY SCHOOL CONSTRUCTION AUTHORITY

A. Coordination with NYCSCA

1. The Contractor shall plan and coordinate its operations with New York City School Construction Authority (NYCSCA) and New York City Department of Education (NYCDOE) for any site classified as a Jointly Operated Playground (JOP).

2. The Contractor is not permitted to conduct any construction activities at any site classified as a JOP during state testing. State testing at schools typically occurs in the following months:

   a. Public Elementary Schools: April, May, and June.

   b. Public Junior High Schools: March, April, May, and June.

   c. Public High Schools: January, March, April, May, June, and August.

3. Normal Project Working Hours" for JOP sites are between the hours 9 AM through 6 PM, Monday through Friday (except for holidays), unless otherwise approved in writing by the school.

3.08 DEW POINT CHART FOR PAINTING

The following chart shall serve as a guide in finding the minimum allowable temperature for paint application under the various items of this Contract. The painting contractor is required to carry a surface temperature thermometer to prove that the surface temperature is above the minimum as required in this Chart:

DEW POINT CHART (Degrees Fahrenheit)

Ambient Air Temperature

Percent Relative Humidity	20	30	40	50	60	70	80	90	100	110
90	18	28	37	47	57	67	77	87	97	107
85	17	26	36	45	55	65	75	84	95	104
80	16	25	34	44	54	63	73	82	93	102
75	15	24	33	42	52	62	71	80	91	100
70	13	22	31	40	50	60	68	78	88	96
65	12	20	29	38	47	57	66	76	85	93
60	11	19	27	36	45	55	64	73	83	92
55	9	17	25	34	43	53	61	70	80	89
50	6	15	23	31	40	50	59	67	77	86
45	4	13	21	29	37	47	56	64	73	82
40	1	11	18	26	35	43	52	61	69	78

DEW POINT: Temperature at which moisture will condense on surface. No coatings should be applied unless surface temperature is a minimum of 5 degrees F above this point. Temperature must be maintained during curing. To calculate the proper surface temperature, use the above charts follows:

EXAMPLE: If air temperature is 70 degrees F and relative humidity is 65%, the dew point is 57 degrees F. No coating should be applied unless surface temperature is 62 degrees F minimum.

CONTRACT GI-CONS-7
SECTION 01 14 00
WORK RESTRICTIONS

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 27 00
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. The Total Bid Price for the Contract shall include the following items in the bid schedule of prices.

1. Lump Sum Prices (Contract Item LS-1 and LS-2)
2. Unit Price Items (various Contract Items)
3. Allowances (Contract Items A-1 and A-2)

B. Excluding the Allowance and Unit Price items specified in this Section, no separate payment will be made for the Work. All costs thereof shall be included by the Contractor in their lump sum prices bid for the Contract.

C. Payment of the total bid price shall be in accordance with the requirements of the Contract Documents.

D. The following index of this Section is presented for convenience:

Article	Title	Section Page
PART 1	GENERAL	1
1.01	SUMMARY	1
1.02	PAYMENT	1
1.03	RELATED SECTIONS	1
1.04	REFERENCES – Not Used	1
1.05	LUMP SUM PRICE CONTRACT ITEMS	2
1.06	UNIT PRICE ITEMS	2
1.07	ALLOWANCES	2
PART 2	PRODUCTS – NOT USED	3
PART 3	EXECUTION – NOT USED	3

1.02 PAYMENT

A. There is no separate payment provision for this Section.

1.03 RELATED SECTIONS

A. Not Used.

1.04 REFERENCES – NOT USED

1.05 LUMP SUM PRICE CONTRACT ITEMS

A. Contract Item LS -1 – Mobilization

1. Under Contract Item LS-1 – Mobilization, the Contractor shall offset all costs necessary to commence the Work, including but not limited to staging and production, supervision and prefinancing as required.

2. The amount bid for mobilization, as indicated in the Schedule of Prices, shall not exceed four percent (4%) of the total bid price for the Contract, excluding the bid price for allowances. Should the Contractor's bid for mobilization exceed 4%, the bid for mobilization shall be adjusted to ensure that it does not exceed 4%.

3. The LUMP SUM price bid for mobilization shall be payable to the Contractor whenever ten percent (10%) of the Work of this Contract has been completed to the satisfaction of the Engineer. For the purposes of this item, ten percent (10%) of the Work shall be considered complete when the total of payments earned, as reflected by estimates of Work done, exceeds ten percent (10%) of the total amount of the Contractor's bid for this Contract.

B. Contract Item LS-2 – Precast Modular Sand Filter System

1. The LUMP SUM PRICE for PRECAST MODULAR SAND FILTER SYSTEM shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the work, including preparations, furnishing and placing of concrete structures, manhole frames and covers, risers, internal aggregate and piping, and other incidental work and expenses necessary to complete the work in accordance with the Contract Documents.

2. See Section 33 39 10 – Sanitary and Storm Sewer Structures for additional information.

1.06 UNIT PRICE ITEMS

A. UP Contract Items have been provided on the bid schedule as unit prices for the Contract.

1. Payment under UP Contract Items will constitute full compensation without limitation for all services, labor, materials, and equipment necessary to complete a respective unit of work.

2. The Contractor and the Engineer shall meet and jointly review the Contractor's "pencil copy" of the payment request prior to submission. The payment request shall include the quantity of unit price Work performed during the performance period.

1.07 ALLOWANCES

A. Descriptions of the Work to be performed under the allowances are found in

the related Sections referenced herein. The amounts of the allowances are given in the bid schedule. The allowances will be included, as listed under this Article, in the total bid for the Contract.

B. All work under the Allowance items set forth above shall be performed on a Time and Material basis. Price to be paid shall be the actual and reasonable cost, calculated in accordance with Articles 26.2.1 through 26.2.13 (excluding Article 26.2.10) and Article 26.3 of the City of New York Standard Construction Contract. The words "Extra Work" in the above referenced Articles shall be substituted with "Allowances"as outlined in this Specification.

C. **Contract Item A-1**: Allowance for unforeseen hazardous material remediation, material sampling and laboratory analysis undertaken to characterize excavated materials as hazardous waste, and disposal of hazardous waste, as per Section 02 26 00 – Hazardous Material Assessment and Section 02 24 20 – Soil Sampling and Analysis.

D. **Contract Item A-2**: Allowance for CCTV inspection as per Section 33 01 30.41 – Cleaning of Sewers and Manholes.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 32 10
PROGRESS SCHEDULE

PART 1 GENERAL

1.01 REQUIREMENTS

A. A Critical Path Method ("CPM") type schedule is not required for the Work of this Project. A "Progress Schedule" shall be prepared in the form of a horizontal bar chart, with a separate bar for each major Work activity or operation as detailed in Part 2 of this Specification.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

B. Section 33 05 05.33 – Double Ring Infiltrometer Testing

1.03 PAYMENT

A. There will be no separate payment for generating, submitting and maintaining the Progress Schedule; all related costs shall be deemed subsumed in prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Progress Schedule shall be submitted within fourteen (14) calendar days after issuance of Notice to Proceed. It shall not contain Contract changes or delays which may have occurred during the interim schedule development period. These changes will be entered on the first update after the schedule has been approved. Updates are to be submitted monthly to the Engineer.

B. The monthly submittal to the Engineer shall include the following:

1. Three (3) copies of the Construction Progress Schedule updates which shall include the following:

   a. Comparison of the baseline schedule against the current update.

   b. Identification of activities modified since the previous submittal.

2. Three (3) copies of the Narrative Report as outlined below.

3. Three (3) copies of the cash flow projections by month.

C. Comments made by the Engineer on the initial and monthly updated schedule will not relieve the Contractor from compliance with the requirements of the Contract Documents.

This review is only for general conformance with the schedule concept of the Project and general compliance with the information given in the Contract Documents.

D. Failure to submit the Progress Schedule, subsequent updates or previously requested corrections of the Schedule by the fifth working day after receipt of comments and/or corrections are cause for withholding any partial payments due or that may become due under the Contract.

E. If at any time during the Project, the Contractor fails to complete any activity by its anticipated completion date, Contractor will be required, within seven (7) days of the missed completion date, to submit to the Engineer a written statement detailing its plans to reorganize its work force and to return to the initial Schedule.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 BAR CHART SCHEDULE FORMAT

A. The Schedule must be prepared in the form of a horizontal bar chart, with a separate bar for each major Work activity or operation.

B. The Schedule must be time scaled (show the duration of a task proportional to the time it takes to complete such task) and shall identify the first day of each week.

C. The maximum sheet size must not exceed the size of the Contract Drawings. If required, additional sheets shall be used for the presentation of the Schedule.

D. Bar Chart Schedule Content

1. The Schedule must show the complete sequence of construction, by major Work activity, with dates for beginning and completion of each element of construction in order to complete the project within the allotted Contract time.

2. Provide sub-schedules to define critical portions of the entire schedule.

3. Show accumulated percentage of completion for each item and total percentage of Work completed, as of the last day of each month.

4. Indicate projected completion date for each activity.

5. Identify activities modified since the previous submittal as well as major changes in scope and other identifiable changes.

E. Bar Chart Activity Cost Data Content

1. The Contractor shall cost load all Work activities. The cumulative amount of all cost loaded Work activities shall not exceed the total Contact price. Overhead and profit shall be prorated for all activities for the entire Project term.

2. The costs must be summarized for each month and shall not exceed the Contract amount plus any approved change orders.

2.02 MONTHLY PROGRESS MEETING AND REPORTS

A. Once each month on a date established by the Engineer, a job Site progress meeting will be held at which time the Schedule will be reviewed. The meeting must be attended by the Resident Engineer, Design Engineering Consultant(s), and the Contractor. The Contractor's representative(s) at the meetings shall have the competence and authority to make any necessary decisions and their statement shall bind the Contractor to the agreed procedures, sequence of operations and time schedules.

B. Prior to the meeting, the Contractor shall obtain the necessary information to update the Schedule to reflect progress to date and to update the plan of work for the balance of the Project. The updated Schedule shall be available at the meeting for review. To update the Schedule, the Contractor shall:

1. Enter actual start and completion dates, for those activities started and/or completed during the previous reporting period.

2. For activities in progress, indicate the percentage completion to date.

3. For activities not yet started, review and revise as necessary the estimated start and completion dates.

4. Add Contract modifications approved by the Engineer.

5. Updated status information must be annotated on the Schedule in a manner that the Schedule shall graphically depict the current status of the Work.

2.03 NARRATIVE REPORT OUTLINE CONTENT

A. The Narrative Report Outline shall be accompanied by a transmittal letter.

B. The Narrative Report shall be structured as follows:

1. Contract Completion Date Status:

a. Ahead of Schedule and number of days.

b. Behind Schedule and number of days.

c. Other project or scheduling concerns.

2. Description of Activities

a. Activities completed this reporting period.

b. Activities in progress this reporting period.

c. Activities scheduled next reporting period.

3. Description of any Problem Areas.

4. Current and anticipated delays.

5. Cause of the delay.

6. Corrective action and schedule adjustments to correct the delay.

7. Impact of the delay on other activities and completion dates.

8. Pending items and status thereof:

a. Status of Permits.

b. Contract modifications.

c. Time extensions.

d. Long lead procurement items.

e. Include review and update Schedule.

f. Safety Reports and code violations or warnings.

g. Other.

PART 3 EXECUTION

3.01 REMEDIAL MEASURES

A. The Engineer may require the Contractor to add to its equipment or construction forces, as well as increase the working hours, if operations fall behind the Contractor's baseline schedule at any time during the Contract term.

B. Under no circumstances will the addition of equipment or construction forces, increasing the working hours or any other method, manner, or procedure to return to the Schedule be considered justification for Contract modification or Extra Work.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 32 30
JOB PHOTOGRAPHS AND VIDEOS

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall engage the services of an experienced professional photographer and video recording firm, approved by the Engineer, to document the progress of Work by taking color job Photographs and videos. The professional shall have a minimum of three (3) years of experience with duties similar to those specified under this Contract.

The Contractor will produce one "Set" of Photographs for each On-Site Green Infrastructure Practice installation. A "Set" of photographs shall include all Pre-Construction, Construction and Post-Construction Photographs required under this Specification. A designee of the Engineer will accompany the photographer for the taking of all Photographs and Videos.

C. Pre-Construction Photographs

1. The photographer, when directed by the Engineer, shall visit each Site prior to start of construction to take a total of ten (10) Photographs and make a two (2) minute video showing existing conditions of the entire project Site and any adjacent areas which could possibly be disturbed during construction.

D. Construction Photographs

1. The photographer, when directed by the Engineer, shall visit each Site during construction on a weekly basis unless the Engineer requests different frequencies of the visits, to take a total of twenty (20) Photographs for the project and to visit the Site when directed by the Engineer to tape a total of thirty (30) minutes of videos. Photographs taken and video minutes taped shall be distributed evenly among the visits and visits shall be distributed evenly over the course of the Project, all subject to the direction of the Engineer.

E. Post-Construction Photographs

1. The photographer, when directed by the Engineer, shall visit each Site at the completion of construction to take a total of ten (10) Photographs and make a five (5) minute video showing the completed Work, the entire Project Site and any adjacent areas which were disturbed during construction.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 78 39 – Final Record Documents

CONTRACT GI-CONS-7
SECTION 01 32 30
JOB PHOTOGRAPHS AND VIDEOS

1.03 PAYMENT

A. The price bid for PHOTOGRAPHS shall be a Unit price for EACH photograph. The Engineer reserves the right to reject any photograph that is not clear, definitive or otherwise satisfactory. Any photograph so rejected shall be subtracted from the total exposures.

B. The price bid for VIDEOS shall be a Unit price for EACH video. The Engineer reserves the right to reject any video that is not clear, definitive or otherwise satisfactory. Any video so rejected shall be subtracted from the total videos.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. International Organization for Standardization

1. ISO 18902: 2013 - Imaging materials -- Imaging Materials – Albums, Framing and Storage Materials.

2. ISO-IEC 14496-14 Information technology -- Generic coding of moving pictures and associated audio information: MPEG-4 Part 14 (MP4 file format).

3. IPTC/XMP (International Press Telecommunications Council's/Adobe Extensible Metadata Platform) Standard

1.05 SUBMITTALS

A. Submittals shall include, but not be limited to, the following:

1. Photographs shall be submitted to the Engineer in accordance with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 01 33 00 – Submittal Procedures.

2 Resume of the professional photographer proposed for this Work;

3. Plot plans indicating the location and unique sequential identifier of all Photographs.

4. Photo log of all photographs and associated metadata in an Excel spreadsheet

5. One (1) set of all Photographs taken for the Engineer’s review and approval for processing further.

6. The Contractor shall provide the Engineer with updated images, key plans and photo logs on a monthly basis.

1.06 QUALITY CONTROL

A. Photographs shall be clear with proper exposure. New Photographs are to be taken immediately if Photographs of an adequate quality cannot be achieved. Photographs shall be of a quality to permit enlargements in accordance with Article 2.01 of this Section.

B. The professional photographer and professional video recording firm shall have a minimum of three (3) years of experience with duties similar to those specified herein. The qualifications of the professional photographer and professional video recording firm shall be subject to review by the Engineer.

C. All videos shall be made using professional-type video cameras and with adequate lighting.

1.07 DEFINTIONS

A. "Photograph" means one (1) digital camera image meeting the requirements of Section 2.01 below, which is approved by the Engineer for development into the products specified herein.

PART 2 PRODUCTS

2.01 PHOTOGRAPHS

A. Digital cameras shall produce records with true optical resolution. Images shall not be resized or interpolated to a higher resolution from a lower resolution.

B. The file format for Photographs shall be color, uncompressed Tagged Image File Format (TIFF) produced by a digital camera with a minimum sensor size of 12 megapixel files or greater, and at an image resolution of not less than 5,000 pixels by 3,500 pixels at 300 dpi or greater

C. Photographic images shall be provided as 8 bit per channel RGB color images.

D. Photographs should be embedded with metadata using the IPTC/XMP (International Press Telecommunications Council's/Adobe Extensible Metadata Platform) Standard. This includes:

1. Project number
2. Project name
3. Contract number and description
4. Unique sequential identifier
5. Description of Vantage point, indication location, direction and other pertinent information
6. General description of what the Photograph represents
7. Global Positioning System (GPS) location data
8. Phase of Construction (i.e. pre-construction, construction or post-construction)
9. Date and time Photograph was taken if not date stamped by camera

10. Name of photographer

11. Name of Department of Environmental Protection witness

E. The Contractor shall transmit one (1) electronic copy of each Photograph to the Engineer for use in preparing descriptions. The Photographs with descriptions will be returned to the Contractor for record management.

F. The Engineer will accompany the photographer for the taking of all Photographs.

G. The Contractor shall furnish hard-back binders to hold the three (3) sets of prints and the digital images. The binders, print, and digital images shall meet the requirements of ISO 18902:2001 "Imaging materials -- Processed photographic films, plates and papers -- Filing enclosures and storage containers".

H. Digital Photographs shall be created, indexed, and transferred to DEP in accordance with the requirements of Section 01 78 39 – Final Record Documents. The Contractor shall provide the Engineer with updated images on a monthly basis.

2.02 VIDEOS

A. Video recordings shall be ASTC format, 1080P (1920 x 1080) using MPEG-4 Program Stream encoding (ISO-IEC 14496-14 "Coding of audio-visual objects -- Part 14: MP4 File Format"), using professional video cameras with clear and succinct narrative. The narrative material shall be developed in conjunction with the Construction Manager, Contractor, and Engineer.

1. All video recordings shall begin with a chapter index listing the contents in detail and providing direct access to each chapter.

> All video recordings must include on parallel tracks metadata (catalogue information) to include the date and time of recording, the name of the area being documented, the project name, direction of travel, the viewing side, project number, Contract number and description, name of photographer and Department of Environmental Protection witness. The date and time shall be on a track separate from the rest of the metadata and, when displayed, shall appear in the upper left-hand corner of the picture. Time and date shall use the following format:
> Time: HH;MM;SS (using 24-hour clock time)
> Date: MM/DD/YYYY

2. The project number, project name, Contract number and description, name of photographer and Department of Environmental Protection witness, when displayed, shall appear on the lower half.

B. Video output from camera used must be capable of producing full HD resolution (1920 x 1080). Geometric distortion should not exceed two (2) percent of picture height at any point in picture area.

C. All recording shall be done with adequate lighting. Written authorization by the Engineer to proceed with video documentation at any areas must be done with consideration of existing environmental conditions. The designee of the Engineer will accompany the photographer during all taping sessions.

D. During the recording period, all records shall be turned over to the Engineer for review of the content and quality. Any portion of the recording deemed unacceptable by the Engineer shall be re- recorded by the Contractor at no additional cost to the City.

E. One copy of all acceptable recordings shall be furnished and shall be properly identified by container number, equipment, location and project name. A record of the contents of each recording shall be provided on a run sheet, identifying each chapter segment of the recording.

PART 3 EXECUTION

3.01 USE OF PHOTOGRAPIC DOCUMENTS

A. All Photographs, aerial Photographs, and videos resulting from the Work under this Contract shall become the exclusive property of the City upon their creation.

B. Neither the Contractor nor the photographer nor the video recording firm shall retain any rights pertaining to the Photographs, aerial Photographs, and videos nor shall they reproduce or otherwise publish or disseminate any of the Photographs, Photographs, prints, CDs/DVDs, or videos taken under this Contract without the prior written approval of DEP.

C. The Photographs, aerial Photographs, and videos shall be considered “work made for hire” under applicable provisions of the Copyright Act, and the City shall be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might subsist. To the extent that such materials do not qualify as “work made for hire”, the Contractor hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to such materials to the City, free and clear of any liens, claims or other encumbrances. The agreements between the Contractor and the photographer and video recording individual or entity shall include these requirements.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS

A. Shop Drawings are required as set forth below. Shop Drawings shall mean drawings, prints, sepias, descriptive literature, test reports, calculations, schedules, materials lists and information such as special drawings, schedules, calculations and curves.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 78 39 – Final Record Documents

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered included in the Work and included in the prices bid for the associated Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. The Specifications for Structural Steel ("ASTM A36")

B. The AISC Specification for Structural Steel for Buildings, current edition

C. The New York City Building Code ("NYCBC").

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Within thirty (30) days after the date for commencement of Work provided in the Notice to Proceed, Contractor shall prepare and submit for approval a schedule of Contract Drawings and Samples which it proposes to submit, along with the dates on which Contractor proposes to submit them. No other submittals will be considered for review until the Submittal Schedule is received and approved by the Engineer.

B. The Contractor shall promptly prepare and submit Shop Drawings of all parts of the Work as specified herein. Shop Drawings which are full size shall be on “D” size, 22" x 34" ANSI (American National Standards Institute) standard drawing sheets. All Shop Drawings Contract shall be drawn to scale.

C. Shop Drawings shall be numbered consecutively and shall accurately and distinctly present the following:

1. All Contract and erection dimensions

2. Arrangement and sectional views

3. Necessary details

4. Kinds of materials and finishes

5. Parts list and description thereof

D. Each Shop Drawing shall be dated and contain:

1. The name of the Project and the Contract number

2. The descriptive names of equipment or materials covered by the drawing and the classified contract item number or numbers under which it is or they are required.

3. The locations or points at which the materials or equipment are to be installed in the Work.

E. Shop Drawings shall be submitted so that they can be approved within the first three (3) submissions. Starting with the fourth submission, liquidated damages will be assessed against the Contractor in accordance with Schedule "A" of the General Conditions.

F. Submittals shall be made to Resident Engineer or Project Manager. Submittals and drawings shall be in the English language and US Customary Units.

G. Shop Drawings for equipment requiring electrical and/or mechanical connections shall show the units of equipment in the proposed position for installation and the details of attachments and connections required, with locations referred to each other and to the structure.

H. Shop Drawings shall be prepared by or under the direction of a qualified licensed professional Engineer, currently registered in the State of New York and which drawings shall bear the imprint of his/her seal and signature. Any Shop Drawing submitted for informational purposes only shall also be subject to this requirement.

I. The approval by the Engineer of Shop Drawings for rigging and hoisting electrical and mechanical equipment and related items in final position will not relieve the Contractor from its responsibility to ensure the safety of the rigging operations, the equipment to be installed and its personnel nor will it relieve the Contractor from its responsibility not to damage completed structures, parts or members thereof or other installed equipment. The Contractor shall make good, repair or replace any damaged or injured items, structural, mechanical, electrical, architectural or landscaping, promptly and effectively to the satisfaction of the Engineer and at no extra cost to DEP.

J. Supporting structures which Contractor's Engineer is required to design shall be of sufficient strength to safely withstand all stresses to which they may be subjected, within permissible deflections, and shall meet the following standards:

1. The Specifications for Structural Steel ("ASTM A36")

2. The AISC Specification for Structural Steel for Buildings, current edition

3. The New York City Building Code ("NYCBC").

Necessary major changes in framing will be covered by supplementary or revised drawings which will be furnished to the Contractor. All changes indicated or necessary to accommodate the equipment and appurtenances shall be incorporated into the Shop Drawing submitted for approval.

1.07 QUALITY CONTROL (NOT USED)

1.08 APPROVALS

A. Submittals to the Engineer shall contain complete data on the Work and full information on related matters.

B. In submitting Shop Drawings for approval, all associated drawings relating to a complete assembly of various parts necessary for a unit shall not be submitted until the assembly of drawings is complete so that they may be checked in relation to the assembly proposed. Where errors, deviations and/or omissions are discovered later, they shall be made good by the Contractor irrespective of any approval by the Engineer.

C. With submittals, the Contractor shall notify the Engineer of all departures from the Shop Drawings and Specifications; otherwise, approval of such submittals will not constitute approval of the departure. Approval of a Shop Drawing will constitute approval of the subject matter thereof only and not of any other structure, material or apparatus shown or indicated.

D. Materials or equipment shall not be ordered, nor shall any Work be done by the Contractor before the materials, the equipment, and the Shop Drawing as herein required have been approved by the Engineer.

1.09 LETTER OF TRANSMITTAL

A. A letter of transmittal shall accompany each submission. If data for more than one Section of the Specifications is being submitted, a separate transmittal letter shall accompany each Section being submitted. Insofar as possible, letters of inquiry concerning certain phases of the Contract shall also deal with only one Section of the Specifications.

B. All letters of transmittal shall be sent to Resident Engineer or Project Manager in triplicate with copies sent as directed by the Engineer.

C. At the beginning of each letter of transmittal and each letter of inquiry, provide a reference heading indicating the following:

OWNER'S Name: NYC Department of Environmental Protection

Project Name: _____

Contract Number: _____

Transmittal Number: _____

Section and Item Number: _____

D. If submittals show variation from the requirements of the Contract, the Contractor shall make specific mention of such variation in its letter of transmittal.

E. Shop Drawings Submittal

1. Shop Drawings shall be submitted in hard copy. Electronic submission shall be allowed only when approved by the Engineer. If approved, Shop Drawings may be submitted electronically in accordance with the protocol and format requirements of the Construction Management Information System being utilized for this project. Specific details will be given at the pre-construction meeting.

2. All Shop Drawings and other data submitted for approval shall have an identifying title.

3. All Shop Drawings and other data submitted shall bear the stamp of approval and signature of the Contractor as evidence that they have been reviewed and approved by the Contractor and that they conform to the requirements of the Contract Documents. Submittals without this stamp of approval will not be reviewed by the Engineer and will be returned to the Contractor. The stamp shall contain the following minimum information completed in ink:

Project Name:

Contract No.:

Contractor's Name:

Date:

Item:

Specifications:

Page No.:

Paragraph No.:

Shop Drawing No.: __ of __

Location:

Submittal No.:

Review Cycle No.:

Contract Shop Drawing Reference No.:

Vendor company name:

Approved By:

F. Shop Drawing Submittal Numbering and Identification: In order to identify and track all Shop Drawing submittals as separate and unique items, the Contractor shall utilize a Shop Drawing submittal identification numbering system as follows:

1. Submittal Number: The Submittal Number shall be a separate and unique number correlating to each individual Shop Drawing that needs to be tracked as a separate and unique item. The Submittal Number shall be a two-part, eight character, alpha/numeric number assigned by the Contractor in the following manner:

   a. The first part of the Submittal Number shall consist of characters that pertain to the applicable GI Specification number.

   b. The second part of the Submittal Number shall consist of three digits (the numbers 001 to 999) to number each separate and unique Shop Drawing submitted under each Detailed Specification.

   c. A dash shall separate the two (2) parts of the Submittal Number.

   d. As an example, the Submittal Number for the third Shop Drawing submitted under Section 5.14 would be GI5.14 003.

2. Review Cycle: The Review Cycle shall be a three-digit number indicating the initial submission or resubmission of the same Shop Drawing submittal. For example:

   a. 001 = first (initial) submission

   b. 002 = second submission (first resubmission)

   c. 003 = third submission (second resubmission)

3. As an example, the Shop Drawing submittal identification numbers for the first submission of the third Shop Drawing submitted under Specification GI5.14 is:

Submittal Number	Review Cycle
GI5.14-003	001

As a second example, the Shop Drawing submittal identification numbers for the second submission of the third Shop Drawing submitted is:

Submittal Number	Review Cycle
GI5.14-003	002

G. Shop Drawings shall include appropriate references to applicable Shop Drawing numbers and Specification Sections and Article numbers.

H. In addition to the original Shop Drawing submittal, the Contractor shall furnish five (5) additional copies to be distributed as directed by the Engineer.

I. In submitting Shop Drawings for approval, all associated drawings relating to a complete assembly of various parts necessary for a unit shall be included. Shop Drawings shall not be submitted until the assembly of drawings is complete, so that they may be checked in relation to the assembly proposed.

J. All items of electrical equipment constituting an operating system and any mechanical units involved therein or necessary for the functioning of such system shall be submitted at the same time and shall include clear diagrams showing circuit functioning and necessary details for field construction.

K. Partial, incomplete, or illegible submissions will be returned to the Contractor without review, for resubmission.

L. After the Engineer completes his/her review, the Shop Drawings will be marked with one of the following notations:

- Furnish as Submitted
- Furnish as Corrected
- Revise and Resubmit
- Rejected
- For Information Purposes Only

1. If a submittal is acceptable, it will be marked "Furnish as Submitted" or "Furnish as Corrected". If a submittal is unacceptable, it will be marked "Revise and Resubmit" or "Rejected."

2. Upon return of a submittal marked "Furnish as Submitted" or "Furnish as Corrected", the Contractor may order, ship or fabricate the materials included on the submittal, provided they are in accordance with any corrections indicated.

3. Upon return of a submittal marked "Revise and Resubmit", the Contractor shall make the corrections indicated, clearly noting any revisions and repeat the initial approval procedure. The "Rejected" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial approval procedure utilizing acceptable material or equipment.

4. Shop Drawings or other submittals not bearing the Engineer's "Furnish as Submitted" or "Furnish as Corrected" notation shall not be issued to Sub-contractors nor utilized for construction purposes. No Work shall be performed or equipment installed without a "Furnish as Submitted" or "Furnish as Corrected" drawing or submittal.

M. In the event the Contractor obtains the Engineer's approval for the use of equipment other than that which is shown or specified, the Contractor shall, at its own expense and using methods approved by the Engineer, make all changes to the Work, including structures, piping, and electrical equipment and controls that may be necessary to accommodate this equipment.

N. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for time required to make delivery of material or equipment after data covering such is approved. The Contractor shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. No materials or equipment will be permitted to be incorporated into the Work nor will such be included in monthly payment estimates until approval thereof has been obtained in the specified manner.

O. The Engineer will review and process all submittals promptly. A reasonable time should be allowed for the Engineer’s review and processing of submittals, the Contractor’s revisions and resubmissions of submittals, and the Engineer’s review and returning the approved submittals to the Contractor.

1.10 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall review submittals made by its suppliers and subcontractors before transmitting them to the Engineer to assure proper coordination of the Work and to determine that each submittal is in accordance with the requirements of the Contract. A note shall appear on the shop drawings indicating that the Contractor has performed this review. Shop Drawings not so reviewed and noted will be returned to the Contractor without further examination.

B. Approval of Shop Drawings will not relieve the Contractor from the responsibility of furnishing materials and equipment of proper dimension, size, quality, quantity, and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Approval will not relieve the Contractor from responsibility for errors of any sort on the Shop Drawings. Approval is intended only to determine conformance with the information given in the Contract Documents. The Contractor is also responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the Work of all trades.

1.11 COORDINATION (NOT USED)

CONTRACT GI-CONS-7
SECTION 01 33 00
SUBMITTAL PROCEDURES

1.12 APPROVAL OF SHOP DRAWINGS NOT A WAIVER

A. The approval of Shop Drawings submitted by the Contractor shall not constitute a waiver of any of the requirements of this Contract nor shall the City be compelled to accept any structure or apparatus unless it passes all approvals, tests and requirements of the Contract.

B. All deviations made during construction from final Shop Drawings previously annotated by the Engineer "Furnish as Submitted", shall be corrected on the Shop Drawings, and resubmitted to the Engineer showing conditions as constructed.

1.13 FINAL COPY-SHOP DRAWINGS

A. Contractor shall furnish all “Final Copy-Shop Drawings” to the DEP. Submittal of these drawings shall be a condition precedent to obtaining the final certificate under Article 45 of the Standard Construction Contract. Final Copy Shop Drawings shall be submitted in accordance with Section 01 78 39 – Project Record Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 35 27
ENVIRONMENTAL, HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Requirements for the Contractor to provide its employees and its Subcontractors a safe and healthful work environment and for performing all Work in compliance with all applicable environmental health and safety (EHS) laws, rules, and regulations.

1. The EHS performance of the Contractor and its Subcontractors is the responsibility of the Contractor. Since effective on-site management is essential for EHS performance, the Contractor shall evaluate the performance of its on-site EHS team on a continuous basis. Where deficiencies are found, the Contractor shall take appropriate action including removal of its personnel or its Subcontractors' personnel.

B. Attachments

1. Exhibit A – Standard Environmental, Health and Safety Requirements Specifications

2. Exhibit B – Bidder's EHS Safety Record and Program Review Questionnaire

C. The following index of this Section is presented for convenience:

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1.02 PAYMENT

A. No separate payment shall be made for performing any Work specified herein. The costs shall be included in the prices bid for the associated Contract items.

1.03 RELATED SECTIONS

A. Section 01 57 16 - Temporary Pest Control

B. Section 02 24 20 – Soil Sampling and Analysis

C. Section 31 23 16 - Excavation

1.04 REFERENCES

A. Definitions

1. "Competent Person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees or the environment, and who has authority to take prompt corrective measures to eliminate them. A Competent Person has stop work authority.

2. "EHS Resources" shall mean the Contractor's EHS Professional(s) and its EHS Site Representative (EHS Rep), as approved by the BEPA EHS unit. This definition shall also apply to the Subcontractors' EHS Resources, where required. This definition also includes any consultant or other EHS personnel associated with the Project. Such EHS personnel are subject to evaluation and approval by BEPA EHS as set forth in this Section.

3. "Environmental Health & Safety Plan (EHASP)" shall mean the plan developed in accordance with all applicable EHS rules and regulations and these Specifications to identify and set forth policies and procedures to control the health and safety concerns and environmental impacts known and unknown at the Site. This plan is not to be confused with the Health and Safety Plan that may be required under 29 CFR 1910.120 for Hazardous Waste Operations and Emergency Response (HAZWOPER).

4. "Job Hazard Analysis" (JHA) shall mean a tool used to document a process by which the steps required to accomplish a work activity are outlined, the actual or potential hazards for each step are identified, and measures for the elimination or control of those hazards are developed.

5. "Hazard Identification" shall mean an existing condition that has the potential to harm people, cause damage to property or the environment, or some combination of these.

6. "Incident" shall mean an undesired occurrence that resulted in injury, illness, environmental release, fire, explosion, motor vehicle event, property damage, equipment failure, non-compliance, and/or adverse impact to operations/work.

7. "Near Miss" shall mean an undesired event in which no property or environment was damaged and no personal injury (i.e., work related harm, damage or loss to a person, including first aid cases as well as recordable injuries) was sustained, but where, given a slight shift in time or position, damage or injury easily could have occurred.

8. "Observation" shall mean an opportunity to improve that does not entail an event included as a hazardous identification, near miss, or incident.

9. "Qualified Individual" shall mean one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems relating to the subject matter, Work or Project.

B. Reference Standards

1. 29 CFR 1926 - Safety and Health Regulations for Construction (Subpart Z – Toxic and Hazardous Substances), Standard No. 1926.1153 - Respirable Crystalline Silica

1.05 DESCRIPTION

A. General

1. In performing the Work of this Contract, the Contractor shall at all times be in compliance with all federal, state, City and local environmental, health and safety laws, rules, regulations, DEP Policies and BEPA EHS Standards.

2. The Contractor shall ensure that its employees and those of its Subcontractors working on a DEP project site under the Contract are clearly identifiable as Project Contractor employees. This may include the use of labeled safety vests or hard hats or other acceptable means in addition to complying with the identification badge requirements of Article 37 of the Standard Construction

Contract. All on-duty employees and those of its Subcontractor issued DEP identification badges must visibly wear the badge at the waistline or above. The Contractor must supply a safe means for wearing badges such as break away lanyards or where the badge may be a safety hazard during the scope of Work, an exemption to wearing the badge will be made as approved by the BEPA EHS Director. Exemptions will be documented in the EHASP and JHA for the specified work activity.

3. The Contractor shall be responsible for the health and safety of its employees, Subcontractors, the public and all other persons at or around the Work Site. The Contractor shall be solely responsible for the adequacy of all construction methods, materials, equipment and the safe and environmentally compliant prosecution of the Work. Where possible, the Contractor shall implement Best Management Practices to reduce injuries, accidents and environmental impacts.

4. The overall site management for EHS is performed by the Engineer in coordination with the DEP Construction Manager. The Construction Manager's EHS staff/consultant and Contractor's EHS staff shall work closely with the Engineer's designated EHS staff (i.e., coordinate to perform joint EHS activities, including inspections, incident investigations, etc.). The Contractor shall coordinate with the Engineer's EHS designee with regard to any Site rules or Site-specific requirements such as working hours, delivery times and operations coordination and sequencing.

5. The Contractor shall perform and document its due diligence in determining whether the Subcontractors it hires to perform Work under the Contract are capable of performing to the EHS standards set forth in this Section. At a minimum, the Contractor is required to perform an EHS evaluation of proposed Subcontractors prior to submitting them for DEP approval. The Contractor must have a Subcontractor EHS evaluation program that is at least as stringent as the DEP Contractor Selection and Management Policy. Poorly performing Subcontractors will affect the Contractor's performance evaluations and ability to obtain future contracts with DEP.

6. DEP requires a drug and alcohol free, healthful, safe and secure work environment. Contractor employees will report to work in an appropriate mental and physical condition for work. DEP reserves the right to require any Contractor or Subcontractor employee to submit to drug testing when cause for reasonable suspicion of a violation of this policy exists. Drug testing may occur when: a) there is reasonable suspicion that an employee is under the influence of alcohol or illegal drugs, or b) an employee has been in involved in an Incident, or involved in an unsafe practice, or c) as

required by BEPA EHS Standards. The Contractor must prohibit any employee from being under the influence of any illegal drug or alcohol while at work, on duty, or operating a vehicle or construction equipment.

7. The Contractor shall implement an EHS Management Program which includes qualified Safety Professionals (SPs) and Environmental Professionals (EPs), collectively referred to as EHS Professionals, along with project management staff, with appropriate competencies to provide EHS direction, guidance, and oversight of all aspects of the performance of the Contract's detailed scope of Work.

8. The Contractor shall ensure that its EHS Resources have appropriate authority to execute their duties and responsibilities as set forth in this Section and under the Contractor's EHS Management Program.

9. The Contractor shall arrange for additional approved EHS Resources to be available during EHS staff absences. The Contractor must inform the Engineer, in writing, of anticipated absences.

10. Contractor EHS Resources:

    a. At a minimum, the Contractor shall provide the EHS Resources described below. The Contractor is required as part of its EHS Management Program to identify any EHS Resources necessary beyond the listed minimums.

    b. For all contracts that employ 100 or less employees on site at any time, the Contractor shall have at least one full-time site EHS Rep. The Contractor may submit a request in writing to the Engineer to waive the requirement of a separate EHS Rep at each site and permit other Contractor employees who are Qualified Individuals to monitor the EHS activities of the employees and to assume all of the responsibilities of the full-time site EHS Rep, if it can show that one EHS Rep can effectively manage multiple sites. The EHS Rep(s) shall have no other duties except those related to EHS on the Contract, and shall not be the project manager, engineer, superintendent or have any other title or project role other than EHS Rep.

    c. For all contracts that employ over 100 employees on site at any time, the Contractor shall have at least two full time EHS Reps. These EHS Reps shall have no other duties except those related to EHS on the Contract, and shall not be project managers, engineers, superintendents or have any other title or project role other than EHS Rep.

d. The Contractor may submit a request in writing to the Engineer to waive the requirements of this Section and permit other Contractor employees who are Qualified Individuals to monitor the EHS activities of the employees on site and to assume all of the responsibilities of the full-time EHS Rep.

e. The Contractor shall ensure that Subcontractors who consistently employ over 100 employees for more than two weeks at a time under the Contract shall have one full-time site EHS Rep. This EHS Rep shall have no other duties except those related to EHS on the Contract and shall not be the Project Manager, Engineer, superintendent or have any other title or project role other than as the Subcontractor's EHS Rep.

f. If the Contract has more than one location in construction at the same time, each location shall be treated as a separate contract for purposes of determining the number(s) of necessary EHS Reps in accordance with paragraphs b through d above.

g. The Contractor's EHS staff shall be provided an appropriate office on the Project Site to maintain and keep available EHS records, up-to-date copies of all pertinent EHS laws, rules, regulations and governing legislation, material safety data sheets, and the EHASP.

11. All site workers have the right to refuse unsafe work which is reasonably believed to present imminent danger to their own safety or the safety of others, the public or the environment, or to City property, without adverse consequences.

12. The Contractor and its Subcontractors shall stop Work and initiate immediate corrective action whenever a Work procedure or a condition at the work site is deemed unsafe by the EHS staff, DEP, Competent Persons, or the Engineer. All Contractor and Subcontractor employees working on site shall report any unsafe or noncompliant work condition(s) immediately to the EHS staff, Competent Persons, or the Engineer. If a stop Work order is issued to the Contractor by the Engineer for unsatisfactory EHS performance, the Contractor shall not make any claim against the City for any losses associated with the stop work order.

13. The Contractor and all Subcontractors are responsible for daily cleanup of their immediate Work areas. Construction scrap and debris shall be removed daily during the course of construction, alterations and repairs. Contractor refuse shall not be allowed to accumulate so as to create trip hazards or block access routes and pathways. The Contractor shall implement procedures to ensure a

high standard of housekeeping. All waste shall be disposed of in accordance with the appropriate regulations and applicable Specifications.

14. The Contractor shall ensure that any sand, soil, plaster, cement, mortar or the like is not deposited or washed into any drain or sewer unless specifically authorized under required permits.

15. When working with (i.e. the cutting, grinding, drilling, chipping, demolition/removal) masonry materials containing respirable crystalline silica (i.e. brick and concrete), the Contractor shall perform work utilizing specified engineering and work practice control methods in accordance with 29 CFR 1926.1153.

B. Environmental Health and Safety Plan (EHASP)

1. The Contractor shall have a written EHASP prepared and signed by both the SP and the EP in accordance with the BEPA EHASP Standard. The EHASP must be signed by a principal or senior manager of the company and project management staff. The EHASP shall be submitted to BEPA for review and approval prior to the start of any work. JHAs will be developed as the Work progresses, in accordance with the BEDC JHA Standard, and will supplement the Contractor's EHASP.

C. Emergency Action Plan

1. The Contractor shall work with the Construction Manager and Other Contractors to develop a single cohesive construction EAP in accordance with BEPA's EAP Standard.

a. The Contractor is responsible for evaluating and ensuring that all identified emergency resources are adequate and appropriate for the potential rescues/emergencies needed.

1.06 QUALITY ASSURANCE

A. Qualifications

1. The Contractor shall ensure that, at all times, its employees and those of its Subcontractors have received OSHA 10-Hour Construction training or OSHA 30-Hour training within the last five (5) years.

2. The EHS Professional(s) shall possess a combination of safety and environmental skills as needed to manage the EHS hazards and issues presented by this Project. The EHS Professional may be one or more persons meeting the individual qualifications for Safety and Environmental Professionals as detailed below.

3. Safety Professional (SP): Persons recognized as an SP shall, at a minimum, possess the following education and experience:

   a. Certification as a Certified Safety Professional granted by the Board of Certified Safety Professionals and five (5) years of documented professional construction EHS management experience; or

   b. Certification as a Certified Industrial Hygienist granted by the American Board of Industrial Hygiene and five (5) years of documented professional construction EHS management experience; or

   c. A Bachelor of Science degree in safety, industrial hygiene, occupational safety and health, environmental health and science, or related field and ten (10) years of documented professional construction EHS management experience.

   d. All documented professional EHS management experience must be in the types of construction and conditions expected to be encountered on the site.

4. Environmental Professional (EP): Persons recognized as an EP shall, at a minimum, possess the following education and experience:

   a. A Bachelor's degree in environmental science, environmental engineering or other related engineering or science field and ten (10) years of documented professional environmental field, management and/or engineering experience. All documented professional environmental experience must be in the types of construction and conditions expected to be encountered under this Contract.

   b. The EP's knowledge and experience should include, but not be limited to, management and disposal of solid and hazardous waste, universal waste, hazardous materials management, chemical and petroleum bulk storage, used oil, chemical and petroleum spill control plans, lead/mercury/PCB and asbestos remediation and management, storm water and soil management, and environmental permit management.

   c. Where required for soil sampling plans and determining soil classifications the EP shall meet the NYSDEC definition for a Qualified Environmental Professional (QEP). In addition, when soils are excavated for onsite or offsite reuse in NYS, the QEP shall be present onsite to monitor contractor compliance with soil management plans, such as the Field Sampling Plan and Soil Excavation, Reuse, Transport and Disposal Plan (SERTD Plan) specified in 02 24 20 – Soil

Sampling and Analysis and 31 23 16 – Excavation, respectively.

5. EHS Rep: Qualifications of the EHS Rep(s) shall include a minimum of: ten years of relevant construction experience, five years of which were exclusively in construction EHS management and successful completion of the following training courses:

   a. BEPA EHS Standards;

   b. Thirty-hour OSHA construction safety and health training;

   c. Resource Conservation Recovery Act/DOT hazardous waste/manifesting training

   d. Permit- required confined space;

   e. BEDC spill prevention and control;

   f. Control of hazardous energy sources (lockout/tagout);

6. The EHS Professionals (SP, EP, or both)and EHS Rep shall have extensive experience with hazard identification, evaluation and controls, and be knowledgeable of all applicable EHS requirements set forth by governing laws, rules and regulations as well as Best Management Practices. Where gaps in the training or experience are identified, DEP may require additional experience or training for approval.

B. Performance Evaluations

1. The Contractor, in conjunction with its Subcontractors, shall be evaluated semi-annually on their performance in implementing the Work of this Contract in accordance with this Section and all related EHS specifications, rules, regulations, laws, policies and procedures. The evaluations are based on the criteria established in DEP's Contractor Selection and Management Policy.

2. In conjunction with the Contractor evaluation form, the EHS Professional(s) and EHS Rep will be evaluated by BEDC EHS and these shall be included in the evaluations.

3. Any EHS Professional or EHS Rep who knowingly falsifies any data, result, audit, document, etc. will be removed from the Project and precluded from further DEP Work.

1.07 SUBMITTALS

A. Environmental Health and Safety Plan (EHASP)

1. The Contractor shall submit the draft EHASP to the Engineer for review and approval within thirty business days from issuance of the Notice to Proceed. In no case shall Work be allowed to commence without an approved EHASP.

2. Initial submission of the EHASP shall be provided as an electronic copy (either Word or Acrobat format) to the Engineer.

3. The EHASP submittal shall be reviewed, and comments shall be provided to the Contractor upon completion of the review.

   a. The Contractor shall work with the Engineer to address all comments in order to obtain EHASP approval.

4. Upon receipt of final approval, the Contractor shall provide one electronic copy (either Word or Acrobat format) of the EHASP to the Engineer.

5. The EHASP shall be available to all of the Contractor's employees working on the Contract.

6. Review, acceptance and/or approval of the EHASP will not impose responsibility for the EHASP on any other party, nor will it relieve the Contractor from any of its EHS responsibilities.

7. The Contractor shall adhere to the requirements of BEPA Incident and Near Miss Reporting and Investigation Standard and shall immediately notify the Engineer of all Incidents involving employee injury and illness, and any other work-related Incidents or Near Misses, damage to equipment and structures, releases or adverse impacts to the environment, or other conditions as defined in the Standard.

8. The Contractor must notify the Engineer and BEPA EHS immediately of any regulatory inspections, notices of citations and penalties, Notices of Violation (NOVs), or any other outside agency violations. In addition, the Contractor shall furnish to the Engineer a copy of all correspondence from OSHA, NYSDEC, the Department of Buildings (DOB) or any other government regulatory agency, within one day of receipt, which may include, but are not limited to, employee complaints, notices of citations and penalties, environmental and NOVs. The Contractor must close out all NOVs and provide documentation to the Engineer that the NOV is closed/corrected as a condition precedent to obtaining final payment.

B. Emergency Action Plan (EAP)

1. Each BEPA project shall have a site-specific EAP in accordance with the BEPA Standard on Emergency Action Plan (EAP) Standard.

C. Contractor EHS Employees

1. The Contractor shall submit to BEPA EHS for approval, the names of the EHS Professional(s) and EHS Rep(s) to be employed. These

include the SP, EP, ESP, EHS Rep and ESW as described in section 1.06.

a. BEPA EHS may request and conduct an interview of the candidates prior to approval.

b. The Contractor shall submit the resumes, copies of certifications, a signed certification of employee training, along with other qualifications of the EHS Professionals and EHS Rep. The resumes shall include items such as: experience, education, EHS courses completed, safety and environmental conferences attended, and certifications achieved. Documentation and/or personal references confirming the qualifications may also be required.

c. The DEP may reject persons proposed as EHS Professionals or EHS Reps for failure to have adequate qualifications or for other cause at any point prior to and during the Contract period, as determined by the Engineer.

D. Risk Control Reports

1. The Contractor will forward to the Engineer any risk control reports generated by its insurance carrier or broker within one day of receipt.

E. Monthly Contractor EHS Report

1. The Contractor shall submit, on or before the 7th day of each month, a summary report of EHS activity for the prior month, including, but not limited to:

a. EHS metrics reported on the metrics reporting form provided as part of the pre-construction package and as may be updated throughout the life of the Project.

b. Chemical Inventory with HTSL (Hazardous and Toxic Substance List) and Subpart Z List.

c. Petroleum bulk storage (PBS) inventory and registration certificates (if applicable).

d. Local Law 77 and DEP Bureau of Environmental Compliance air permits.

e. Summary of audit data including trending and analysis along with root cause and corrective actions/training identified.

f. Summary of the regulatory inspections, notices of citations and penalties, NOVs, or any other outside agency violations (which occurred and were provided to BEPA in accordance with this Section).

g. Statements by the SP and EP discussing their review of the monthly report(s) and recommendations for improvement, as necessary.

h. SP/EP Monthly Report shall include the following:

1. Date of the monthly walkthrough inspection
2. Observations including photographs of any deficiencies identified
3. Proposed methods of correction for deficiencies
4. List of corrective actions implemented from the deficiencies noted in the previous month's report
5. Attach monthly PBS inspection (EP), if applicable.
6. Report shall be signed by the Contractor's SP/EP

i. Detailed information regarding each pesticide application during the prior month, as specified in Section 01 57 16 - Temporary Pest Control.

2. The Engineer shall review the report to verify that the Contractor is effectively managing the EHS requirements under the Contract. If the Contractor has no, or limited Work in a given month, it shall inform the Engineer that no Work was performed or submit the required documentation for those days that Work was performed.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Not Used

1.09 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES

A. Not Used

1.10 WARRANTY

A. Not Used

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Not Used

2.02 MATERIALS / EQUIPMENT

A. EHS Equipment

1. The Contractor shall provide the proper EHS and rescue equipment for all employees, adequately maintained and readily available, for

any foreseeable contingency or situation under the Contract during the performance of the Work.

2. All equipment shall be stored in protected areas and maintained and calibrated in accordance with the manufacturer's recommendations and as specified in the EHASP. Where equipment is required to be inspected and or calibrated, documentation shall be maintained and available for review.

B. Personal Protective Equipment

1. All personnel employed by the Contractor and any visitors entering the job site shall be required to wear appropriate personal protective equipment (PPE) required as specified in the EHASP and the BEPA EHS PPE Standard. The Contractor shall continuously provide and maintain adequate PPE.

2.03 FABRICATION / ASSEMBLING / FINISHES

A. Not Used

2.04 SOURCE QUALITY CONTROL / SHOP TESTS

A. Not Used

PART 3 EXECUTION

3.01 EXAMINATION / PREPARATION

A. EHS Staff Duties

1. 1. The Contractor's EHS staff (SP, EP and EHSR) are responsible for overseeing and managing the Contractor's safe and environmentally compliant performance of all Work.

2. EHS Professional(s)shall be required to initiate, review and implement measures to ensure the health and safety of all Contractor employees, and to protect property and the environment. Each EHS Professional is required to visit the Site and audit the Site conditions, at a minimum monthly, in accordance with the Contractor's EHS Plan or as directed by the Engineer.

3. The EHS Professional will be held accountable to adjust his/her workload to enable proper performance of all of their EHS responsibilities in accordance with all requirements of this Section and all applicable regulations. DEP may request that the Contractor remove the EHS Professional for not meeting the Contract requirements.

4. The SP shall visit the Site prior to developing the Contractor's EHASP. The SP will arrange a visit with the Engineer and perform an inspection of the Site to understand the full scope of Work to be

performed under the Contract. Contract Documents relevant to writing the EHASP can be reviewed and obtained at this time. Facility/Site specific information must be provided, reviewed, and documented in accordance with the BEDC EHS Site Orientation Standard.

5. The EHS Professionals shall visit all Work areas as frequently as necessary, but no less frequently than monthly, to verify that EHS compliance is being achieved. The EHS Professionals shall review hazards, JHAs, and the foremen's and superintendent's preparation and communication of JHAs to workers. The EHS Professionals shall also review the Project team's compliance with, and adherence to EHS requirements, as well as their proactive approach and planning for EHS.

6. The EHS Professionals shall be available for consultation whenever necessary. Prior to and after each visit, the EHS Professional shall sign the visitors' log maintained at the Engineer's office.

7. The EHS Professionals are expected to perform their inspections in concert with the EHS Rep, during which time the EHS Professional will not only inspect the Site, but shall also mentor and direct the EHS Rep. During the inspection, the EHS Professional will evaluate the Contractor and each subcontractor working under the Contract and clearly identify findings and who they are assigned to, using the SP/EP checklist provided in the EHASP. Any findings that cannot be resolved immediately will be assigned to the EHS Rep for follow-up. The EHS Professionals are expected to communicate with the EHS Rep to ensure all identified findings are closed out. The EHS Professionals' inspection shall include programmatic issues such as adhering to the Contractor's EHS program, including, but not limited to, preparing and communicating JHAs and proactively minimizing EHS risks.

8. The EHS Rep will coordinate with the EHS Professionals when questions arise requiring the EHS Professional's expertise. After each visit, the EHS Professional shall prepare a report, including photographs (where necessary), acceptable to the Engineer and BEPA EHS, detailing the findings. The report shall include those hazards and violations discovered during the site visit and when and how they were or will be closed out. Any EHS items not covered or documented by the inspection checklist will be noted in the comments section of the checklist. The report shall be submitted to the Engineer within one business day of the Site visit.

9. The EHS Rep shall be at the job Site full time whenever work is in progress during all shifts.

10. The SP's and EHSR's responsibilities are as follows:

a. The SP is responsible for directing the Contractor's EHS program, ensuring implementation by the Contractor and all Subcontractors, and for directing and monitoring all activities of the EHS Rep. If the EHS Rep is not enforcing the EHASP, JHAs, or other elements of the EHS program, the SP shall either recommend retraining or removal of the EHS Rep from the Project by submitting a letter to the Engineer and the Contractor.

b. The EHS Rep must review JHAs to verify that the Work activity's EHS issues and hazards are accurately identified, addressed, and communicated. JHAs shall be regularly communicated to affected employees and must be made available in the areas where the affected employees are working. The EHS Professionals are responsible for reviewing JHAs at least monthly to verify that they adequately reflect the recognized hazards and controls of the tasks being performed. JHAs shall be provided to the Engineer or BEPA EHS when requested.

c. Both the SP and EHSR shall schedule and conduct EHS meetings and training programs as required. A specific schedule of these meetings and an outline of topics to be covered shall be provided with the EHASP. The Engineer shall be advised in advance of the time and place of such meetings, and DEP personnel shall be invited to attend the meetings.

d. All Contractor employees shall be instructed by the SP and the EHS Rep on the recognition of hazards, safe Work practices and environmental precautions, the contents of the EHASP, and the use of environmental, personal protective and emergency equipment. Such training shall be documented, recorded, and provided as part of the EHS monthly report(s). EHSRs and EHS Professionals will attend regularly scheduled meetings held by the Engineer and BEPA EHS including, but not limited to, the EHS Pre-Construction Meeting.

e. Determine that operators of specific equipment are qualified by training, certification and/or experience before they are allowed to operate such equipment. Ensure documentation of licenses, certifications and training by the appropriate agencies (for example OSHA, NYC DOB, NYC Fire Department, etc.) are on site and current, prior to start of Work.

f. Verify implementation of the BEPA Emergency Action Plan (EAP) Standard.

g. Develop an effective Site communication plan that includes, signage, and verbal and written communication of EHS issues and notices.

h. Post all appropriate notices regarding EHS regulations at Site location(s) which afford maximum exposure to all personnel at the job Site.

i. Post appropriate instructions and warning signs regarding all hazardous areas or conditions which cannot be eliminated. Identification of these areas shall be based on experience, site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls.

j. The EHS Rep shall conduct EHS inspections a minimum of twice per shift to ensure that all machines, tools and equipment are in a safe operating condition, and that all Work areas are free of safety and environmental hazards. The EHS Rep shall take necessary and immediate corrective actions, where feasible, to eliminate all unsafe acts and/or conditions, and submit to the Engineer each day a copy of the findings on the inspection check list report forms established in the EHASP. Detailed checklists shall be tailored to the EHS hazards and conditions on the Site, and shall include a comments section to include findings not specifically listed on the checklist.

k. Whenever DEP and its agents perform both announced and unannounced inspections of the Contractor's EHS performance, a member of the Contractor's on-site EHS team shall be available during the inspections. The SP will coordinate inspections with the Engineer and DEP inspectors upon request. The Contractor shall take immediate corrective action, where feasible, to eliminate hazards identified by the Engineer, DEP inspectors, or any other entity. The Contractor, if requested, shall develop and implement a plan detailing corrective actions necessary to mitigate the presence of noncompliant conditions and actions following Incidents, citations, NOVs, or identification of patterns of noncompliant conditions and acts.

l. Notify the Engineer and BEPA EHS immediately of all inspections by regulatory agencies, and submit to the Engineer and BEPA EHS copies of all EHS reports, citations, and NOVs from regulatory agencies and insurance companies within one workday of receipt.

m. Implement an effective fire protection and prevention program at the Site throughout all phases of the construction Work in

accordance with BEPA's Fire Prevention Standard. The Contractor will ensure the availability of fire protection and suppression equipment adequate to control the degree of fire hazard encountered during construction.

n. Provide and document appropriate Site-specific orientation to Contractor employees, visitors, and Subcontractors communicating recognized hazards present at and surrounding the Site(s) and facility in accordance with BEPA's Site Orientation Standard and DEP's Contractor Selection and Management Policy.

o. Perform all tasks and responsibilities as identified in the EHASP.

3.02 APPLICATION

A. Not Used

3.03 FIELD TESTING / QUALITY CONTROL

A. Hot Work

1. The performance of Hot Work is prohibited unless performed under the issuance of a Hot Work permit from the Permit Authorizing Individual (PAI). The PAI shall be provided by the DEP.

a. Where the DEP and Engineer are not routinely present, the Contractor may be allowed to obtain PAI certification for Contract employees.

2. The Contractor shall provide the Engineer with a JHA at least 48 hours prior to the performance of Hot Work. The JHA shall identify the following:

a. The locations where the Work is to performed;

b. Equipment to be used;

c. Gases or vapors within or adjacent to the location that have the potential to create a combustible atmosphere;

d. Controls required to mitigate or prevent the accumulation of gases or vapors in quantities that have the potential to create a combustible atmosphere; and

e. Controls or methods to promptly discontinue the use of and de-energize equipment when a combustible atmosphere is detected.

3.04 STARTUP / DEMONSTRATION

1. Not Used.

3.05 ADJUSTING / PROTECTION / CLEANUP

A. Not Used

END OF SECTION

ATTACHMENT A

STANDARD ENVIRONMENTAL, HEALTH AND SAFETY SPECIFICATIONS

To be included in all contracts where applicable

1. Scope

The goal of the New York City Department of Environmental Protection (DEP) is to run the safest operations and capital program in the country with the best environmental compliance record of any large water and wastewater utility. To achieve that goal, DEP strives to hire safe and environmentally compliant contractors and to systematically manage, monitor and evaluate contractors that are working on DEP projects and at DEP locations.

As such, DEP has developed procedures to ensure that contractors' environmental, health and safety (EHS) records and programs are evaluated when DEP is selecting a contractor or approving a subcontractor. These procedures require that all contractors are properly prepared and trained to safely complete the work and to adhere to all EHS laws, rules, and applicable standards as contractually required. DEP work sites are subject to requirements regarding qualification, supervision, and activities of contractors.

These contract requirements (Specifications) set forth the EHS eligibility standards for contract award as well as the applicable EHS training requirements and requirements specific to working on a DEP project. The Contractor must comply with applicable federal, state, and local codes and standards, including environmental and occupational safety and health requirements, as well as any additional special requirements invoked by other sections of the Contract.

Unless otherwise specified, these Specifications do not apply to:

- Contractors providing services with little likelihood of affecting DEP employee safety, DEP property, the public, and the environment, such as consulting services, light janitorial work, laundry, delivery (e.g., food and drink, furniture, filing cabinets), other supply services and shipping, or other products/services as determined by the contracting Bureau.
- Entities funded by DEP which do not directly provide labor or services to DEP, but which utilize funds to independently contract with others to provide services. Examples include other governmental agencies, grant recipients, and non-profit groups. Bureaus may require such entities to comply with the requirements of this policy by specifically adding these criteria into an agreement or contract;
- Other products or services, as determined by the contracting Bureau that do not have the potential to impact safety, public health or the environment.

2. Pre-Award

2.1 Contractor Safety Record Submittals

Within 5 business days of DEP request, the apparent low bidder shall provide the information specified below. Failure to provide the required information may result in a rejection of the bid.

2.1.1 NY Intrastate Experience Modification Rating (EMR) for past 3 years.

Bidder shall provide its NY Intrastate EMR for the past 3 years on its insurance broker's letterhead. EMR information provided by the New York State Insurance Rating Board is also acceptable. If the bidder does not have a NY Intrastate EMR, its out-of-state EMRs shall be submitted. DEP may also request a company's Workers Compensation Loss Runs to verify EMR.

Bidders that do not have an EMR shall provide, for the past 3 years, their: (a) Workers Compensation Loss Runs (this information shall be provided by their insurance broker); (b) OSHA Total Recordable Cases (TRC); and (c) Days Away, Restricted, or Transferred (DART) rates.

Note: if the bidder is not required to maintain such information, it shall provide an explanation for the exemption.

Bidders are expected to have an EMR of 1.0 or below. If a bidder's EMR is greater than 1.0 in any single year within the 3-year period, the bidder shall submit the following:

- An explanation and supporting documentation explaining why the EMR is greater than 1.0 and detailed steps that have been taken to improve the bidder's EHS performance.
- Five years of Workers Compensation Loss Runs (this information shall be provided by the insurance broker) and documentation of payroll during that same period.
- For each indicated loss, the bidder shall provide a summary of the loss facts and investigation, including a summary of corrective actions undertaken and modifications or development of EHS programs.
- If the bidder has been notified by the New York Compensation Insurance Rating Board (NYCIRB) within the past 3 years that they must participate in the Industrial Code Rule 59, Workplace Safety and Loss Prevention, program then the bidder shall provide a copy of their Consultation Report from a Certified Consultant, documentation of the implementation of the Report identified

corrective action(s) and recommendation(s), and a copy of the carrier required re-inspection. If the bidder elected to instead receive a worker's compensation premium surcharge, they shall so indicate.

2.1.2 Last 3 years of OSHA 300 Forms (Logs of Work-Related Injuries and Illnesses) and/or 300A redacted summary worksheets (as available, to verify accuracy of information provided).

Note: if the bidder is not required to maintain such information, it shall provide an explanation for the exemption.

If a bidder's EMR is greater than 1.0, the bidder shall submit their OSHA 300A redacted forms for the entire period covered by the work loss runs indicated in Section 2.1.1 above.

2.1.3 List of all federal, state and local regulatory agency (e.g., OSHA, NYSDEC, USEPA, USDOT, DEP, FDNY and NYCDOB, etc.) notices of violation, notices of deficiencies, and fines issued/received in the past 3 years; the letter listing these (or stating that no notices of violation, notices of deficiencies, and no fines have been issued/received in the past 3 years) shall be on company letterhead and certified as complete and accurate by the sworn, notarized statement of a principal or officer of the bidder.

2.1.4 List of reportable releases of chemical or petroleum products associated with the bidder's operations during, at a minimum, the last 3 years; the letter listing these (or stating that no reportable releases associated with the bidder's operations have occurred during the past 3 years) shall be on company letterhead and certified as complete and accurate by the sworn, notarized statement of a principal or officer of the bidder.

2.1.5 A written description of the bidder's EHS programs (and associated training), including any EHS programs and procedures employees will be required to follow while providing labor or services for DEP. Upon request by DEP, the bidder shall also provide a protocol for the EHS evaluation of any subcontractors that could be proposed by it for DEP approval.

2.1.6 A sworn, notarized certification from a principal or officer that, if the bidder is awarded the Contract, its EHS programs shall meet all OSHA, USEPA, NYS and local regulations, and the bidder shall abide by applicable DEP policies and procedures, as appropriate, and as provided by DEP. (Refer to Bidder's EHS Performance and Program Review Questionnaire/Checklist that is included with the bid submission materials in the Invitation for Bids package).

2.1.7 For bidders that are joint ventures, the above information must be provided and will be reviewed for the joint venture itself and the individual joint venture partners.

2.2 Responsiveness

The items submitted under 2.1 will be evaluated as the contractor's safety record. Further, the bidder's EHS submittals and training program descriptions must indicate that the bidder:

- understands its regulatory requirements
- has a proactive and acceptable EHS and training program in place
- has performed acceptably on prior DEP projects as applicable.
- has adequate EHS professionals available for the project
- has demonstrated an acceptable safety record for the time periods reviewed.
- has demonstrated an acceptable safety record on similar projects over the past three years; and
- has certified that its program and training comply with all regulatory requirements.

3. Proposed Subcontractors

3.1 The subcontractor approval process requires an information submittal that includes the proposed subcontractor's EMR, EHS program descriptions and certifications like those in sections 2.1 and 2.2.

3.2 The standards listed in Section 2.2, above, shall also apply to the approval of proposed subcontractors that would be performing a significant volume or aspect of the project.

4. Contractor Orientation

4.1 Prior to commencing any work at any DEP location, the Contractor shall be required to attend an orientation. After attending the initial orientation, the Contractor shall, in turn, provide an orientation to any of the Contractor's employees assigned to work at the DEP location. This training must also be provided to subcontractors, suppliers[1], and Contractor visitors who will be onsite.

4.2 During orientation, DEP will provide the Contractor with the most current:

4.2.1 Work site-specific hazardous conditions and related information (e.g., hazardous chemicals present at the work site, locations of Safety Data Sheets, and required safe work practices including minimum Personal Protective Equipment (PPE) requirements);

4.2.2 Facility-specific lockout/tagout requirements;

[1] This requirement does not apply to suppliers providing services or products that are determined by the Bureau administering the Contract to have little likelihood of affecting DEP employee safety, property, the public, or the environment.

4.2.3 Applicable sections of the work site's Emergency Action Plan and, at a minimum, the emergency contact numbers, facility map, notification procedures, evacuation procedures, evacuation routes, assembly areas, and description of alarms;

4.2.4 Access control procedure;

4.2.5 Location of restricted areas accessible from the work area or approaches to the work area (e.g., Process Safety Management/Risk Management Plan-covered processes, permit-required confined spaces, and other high-hazard areas) and procedures for working in and around restricted areas;

4.2.6 DEP's Workplace Violence Prevention Policy;

4.2.7 DEP's Possession of Firearms in the Workplace Policy;

4.2.8 All other applicable DEP policies and procedures that will, or may, be necessary for the work; and

4.2.9 Information on known constituents of concern in the work area, including areas known to contain, or having historically contained, lead, asbestos, PCBs, and mercury.

4.3 If provided one by DEP, the Contractor shall distribute to all workers who are to attend the orientation a hazardous material and safe work practices information package. If possible, it will be distributed at least two days prior to the orientation. The workers shall sign for the packages and indicate that they have reviewed the contents prior to their attending the orientation.

4.4 Prior to commencing any work, a responsible official of the Contractor shall certify that it understands its obligations to train its employees and that it has been informed of and will abide by applicable DEP policies and procedures while it is working at DEP work sites.

4.5 If the Contractor or a subcontractor needs to add additional or replacement worker(s) to its crews, the new worker(s) must be provided with the same information received by other workers and receive the orientation for the work site(s).

4.6 The Contractor shall use the Contractor Training Certification form provided by DEP (or an equivalent form), as the record of those Contractor and subcontractor employees who have completed the facility orientation.

5. Requirements During Work

5.1 When and where required by the DEP Bureau of Police and Security, the Contractor, and its subcontractors, and all their respective employees shall, always when working at the site(s), wear photo-identification badges.

5.2 The Contractor shall develop a work plan that identifies and addresses safety hazards and environmental requirements prior to starting any work.

5.3 PPE must be utilized in accordance with the work plan.

5.4 The Contractor and its subcontractors and all their respective employees shall, upon request, produce certificates, licenses, and other documentation that laws or regulations require them to obtain them to conduct activities they are performing (e.g., Asbestos Worker Certificate, FDNY Certificate of Fitness in New York City).

5.5 The Contractor's and its subcontractors' employees are restricted from entering all high-hazard process areas unless access is required to perform their work. In coordination with the Contract Supervisor, the Contractor or subcontractor employees entering such process areas must obtain permission from the on-duty operator or supervisor in person or by the telephone before entering these areas. Further, Contractor or subcontractor employees must inform the on-duty operator or supervisor in person or by telephone upon leaving and follow all other facility access control procedures.

5.6 Any worker who fails to abide by the EHS requirements presented in the safety orientation shall, at the sole discretion of the DEP, be denied access to the facilities and shall be replaced by the Contractor, as directed by DEP.

5.7 The Contractor shall immediately inform the DEP Contract Supervisor and the facility's most senior manager of all incidents and all near misses; and of any notices of violation (NOVs), notices of deficiencies (NODs), and fines issued by and/or received from regulatory agencies resulting from work performed. Initial written reports shall be submitted by the next day. Note that other specification sections in this Contract may include additional investigation and reporting requirements and must be consulted. The more stringent requirements will apply in the event of any conflict.

5.7.1 The Contractor must close out all NOVs, and all other violations/deficiencies, and pay the appropriate fines before final or subsequent payments can be made by DEP. The Contractor will not receive final payment if there are open violations or notices of non-compliance.

6. Evaluations of Contractor EHS Performance

6.1 DEP will perform evaluations of the Contractor's performance to ensure compliance with all EHS laws and regulations and DEP and facility EHS requirements. Such

evaluations will be considered when evaluating the Contractor's bids for future contracts.

6.2 The Contractor shall be rated on each category shown on the Contractor EHS Evaluation form a copy of which should be provided to the Contractor by the Contract Supervisor. ("NA" is acceptable where the requirement was not applicable). The Contract Supervisor may include other specific EHS categories under "Other" that are of particular importance to the project. The Contract Supervisor shall inform the Contractor prior to commencement of work when this is the case.

6.3 DEP considers compliance with and conformance to EHS requirements to be of the utmost importance, and recognizes that, on particular projects, the importance of compliance with certain requirements may carry more weight than others, as failure to comply may present a greater level of risk. The final rating for the job in such a case may be weighted more heavily on specific categories (one or two) if compliance with that/those program requirement(s) is paramount to worker safety and/or environmental protection. In this case, the Contractor shall be notified prior to the commencement of work or through the development of risk-based safety plans during the project.

6.4 The following rating scale shall be utilized in conducting the Contractor evaluations:

Excellent – Contractor exceeded EHS contractual, policy, and/or regulatory requirements. Work was accomplished with no observed deficiencies and no violations. Contractor proactively and effectively addressed potential risks. Contractor demonstrated EHS leadership and best practices and showed alignment with DEP's EHS goals.

Good – Contractor met or exceeded most EHS contractual, policy, and/or regulatory requirements. Work was accomplished with limited or minor observed deficiencies or minor violations. Correction and preventative actions taken by the Contractor were timely and effective.

Fair – Contractor met EHS contractual, policy, and/or regulatory requirements. Observed deficiencies or violations were satisfactorily corrected and did not indicate a pattern of repetition. The correction and preventative actions taken by the Contractor were completed in a timely manner.

Poor – Contractor did not meet some EHS contractual, policy, and/or regulatory requirements. EHS deficiencies and/or violations were identified, but the Contractor either did not identify corrective and preventative actions or proposed correction and preventative actions that appeared to be only marginally effective.

Unsatisfactory – Contractor did not meet a significant number of EHS contractual, policy, and/or regulatory requirements. EHS deficiencies and/or violations were identified, but Contractor did not develop a Corrective and Preventative Action Plan, or failed to implement a Corrective and Preventative Action Plan, or implemented an unsuccessful Corrective and Preventative Action Plan. Deficiencies and/or violations indicated a pattern of repetition.

6.5 A Contractor that disagrees with an overall evaluation of "Poor" or "Unsatisfactory" can submit a written request for reconsideration to the DEP Contract Supervisor within 10 business days after receipt of the written evaluation. The request for reconsideration must set forth all the relevant information and arguments and be accompanied by any documentation relied on in support of the request. The request for reconsideration will be reviewed by the Deputy Commissioner overseeing the Bureau or his or her designee. The Deputy Commissioner or designee will notify the Contractor of the determination of the request in writing. Such determination will be final.

6.6 If its evaluation (other than the final evaluation) is "Poor" or "Unsatisfactory," the Contractor must prepare a Corrective and Preventive Action Plan to correct and prevent recurrence of the deficiencies identified through the evaluation.

* * * * * *

ATTACHMENT B

BIDDER'S EHS SAFETY RECORD AND PROGRAM REVIEW

QUESTIONNAIRE

CONTRACT GI-CONS-7
SECTION 01 35 27
ENVIRONMENTAL, HEALTH AND SAFETY REQUIREMENTS

DEP Contract Name or Number:		
Contractor Name:		
Location(s) and description of work to be performed (attach work summary from contract):		
Provide as part of the pre-award submittal:	☐	EMR Rating (1.0 or below)[1]
	☐	OSHA 300 logs and/or 300A redacted worksheets
	☐	Sworn, certified and notarized letter with information on all regulatory violations and reportable releases in the past 3 years
	☐	Sworn, certified and notarized letter from principal that if awarded the contract, its EHS programs shall meet all OSHA, US EPA, NYS and local regulations and shall abide by all DEP policies and procedures (with information on all reportable releases in the past 3 years
	☐	Written description of firm's EHS and training programs
Attach Table of Contents of Firm's EHS programs and describe below		
Describe employee EHS training below, including new employee training (or attach)		
Describe protocol for subcontractor approval and onboarding below (or attach)		

[1] Contractors with EMRs over 1.0 must provide the documents references in sections 2.1.1 of the DEP Contractor Selection and Management Policy Attachment A (Rev. 4).

Certifications
I certify that the EHS and Training Programs for:

(Company Name)_____

comply with applicable OSHA, USEPA, NYSDEC and NYC regulatory requirements and that the information presented on this form and attachments is accurate and complete. Our company is aware and understands its obligations under the OSHA, USEPA, state and NYC standards (if applicable).

Signature: _____ Title: _____

Print Name: _____ Date: _____

CONTRACT GI-CONS-7
SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 REQUIREMENTS

A. All Work and materials shall fulfill the requirements of the New York City Board of Standards and Appeals, shall be trademarked and grade marked and shall meet the approval of City, and all other regulations and standards indicated on the Contract Drawings and included in the Specifications and submittals.

B. The Specifications of the American Society for Testing and Materials (ASTM), latest edition, shall apply to any and all Work for which the ASTM Standard has been established, unless otherwise specified. Each manufacturer or supplier of each material shall certify in writing that their material conforms to the applicable ASTM Specification.

C. The Contractor shall be responsible for knowing and complying with all applicable regulatory requirements - federal, State and local - pertaining to legal disposal of all construction and demolition waste materials.

D. All Work shall conform to the minimum accessibility standards set by New York City Local Law 58 (1987) and the Uniform Federal Accessibility Standards, 1984.

E. All devices, materials, and installations shall conform to the current latest edition of the applicable requirements of the New York City Administrative Code, the contract Documents and documents specified elsewhere in the specifications. In the event of a conflict between any codes or laws of the City of New York and any other applicable code or standard, the City of New York codes and laws shall take precedence.

1.02 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered included in the Work and included in the prices bid for the associated Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Contract Drawings and Specifications.

B. New York City Department of Environmental Protection Sewer Design Standards, March 2023 or latest edition.

C. New York City Parks and Recreation Capital Projects Standard Details, September 2020 or latest edition.

D. New York City Department of Transportation Standard Details of Construction, June 2022 or latest edition.

1.05 REGULATORY COMPLIANCE

A. The Contractor shall be responsible, at no additional cost to the City, for the filing of all required applications, permits, reports and forms with all governmental agencies having jurisdiction. The Contractor shall obtain all work permits and certificates as required to complete the Work.

1. Work permits and certificates may be required from the following Agencies:

a) New York City Department of Parks and Recreation:

b) New York City Department of Transportation

c) New York City Department of Environmental Protection

d) New York City Department of Buildings

e) New York City Police Department

B. The Contractor shall be responsible, at no additional cost to the City, for complying with any and all open applications, permits, reports and forms with all governmental agencies having jurisdiction.

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section includes the following temporary facilities and controls that shall be provided under the Contract.

1. Power
2. Lighting
3. Heat (for construction related work)
4. Water
5. Sanitary facilities

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 74 17 - Cleaning and Site Maintenance

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered included in the Work and included in the prices bid for the associated Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Contract Drawings, Specifications and General Conditions.

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 REQUIREMENTS FOR TEMPORARY FACILITIES & CONTROLS

A. Power

Contractor shall provide, install, and maintain sufficient power for the execution of the Work, including all required metering, wiring and power for light and heavy-duty equipment, electric welding, air compressors, temporary lighting, etc. in conformance with applicable codes and federal, state, and local, regulations.

1. The Contractor shall provide weatherproof, grounded electrical power service and a distribution system of sufficient size, capacity, and power characteristics during the entire construction period to accommodate the needs of the Project. Provide properly configured NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment. Upon Final Completion, to the satisfaction of the Engineer, remove temporary power lines and equipment.

2. For all non-heating, non-lighting and non-hand tool power requirements (i.e. power for heavy duty equipment, electric welding, compressors, etc.), the Contractor shall, at Contractor's sole expense, furnish, install, and maintain all power wiring and all equipment necessary to connect to the temporary power system for the Work, and upon completion of the Work, to the satisfaction of the Engineer, shall remove and temporary power lines installed.

B. Lighting

If required due to the temporary removal or replacement of lighting at the exterior Site, interior, or security lighting, Contractor shall install, maintain, and remove equal temporary levels of lighting. Contractor shall not remove temporary lighting equipment upon completion of Work until directed by the Engineer. The Contractor shall provide suitable temporary lighting required for the proper prosecution and inspection of the Work. If, in the opinion of the Engineer, these facilities are inadequate, the Contractor will not be permitted to proceed with any portion of the affected Work.

C. Heat

Contractor shall provide temporary heat and enclosures as necessary and required to complete Work. Provide the ambient temperature and humidity conditions required by the material or equipment manufacturers and others as per Contract Documents. Maintain such ambient conditions as necessary and protect all installed work until completion of Project.

D. Water

A temporary water system adequate for the execution and completion of the Work shall be installed, maintained, and removed by the Contractor. The temporary water system shall be available for all trades to use during the execution of Work. Contractor shall be responsible for any damage that is caused by the temporary water system.

1. The Contractor must obtain all necessary permits from the Bureau of Water and Sewer Operations.

2. Such permits include but are not limited to Hydrant, Tap, Plug, Wet Connection, and Repair/Relay of Water Service Line. City water necessary to perform the Work of the Contract will be furnished by the Bureau of Water and Sewer Operations without cost to the Contractor.

E. Sanitary Facilities

Contractor shall provide temporary toilet facilities adequate for the workforce required by the Contract. Contractor shall comply with all applicable codes and maintain in good order and cleanliness. All toilet facilities shall at all times and for the complete duration of the Project provide for the presence of both male and female workers on the site, with equal facilities and privacy provided for both, with additional facilities provided as necessary.

The temporary sanitary facilities requirements may be waived by the City if existing toilet facilities are available at the Site.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 55 26
TRAFFIC CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall maintain and protect traffic for the duration of the Contract Work performed in the street and/or sidewalk. The purpose is to protect the public from all damage to persons and property within the Contract limits and furnish, erect and maintain warning signs, barricades and lamps, all in accordance with the Contract Drawings, Specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

B. Section 01 41 00 – Regulatory Requirements.

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the Bid Sheet. Each unit shall include the cost of all labor and materials, including barricades, timber curbs, generating units, signs, permits, removing temporary detours and restoring disturbed areas, and all other incidental expenses necessary to complete the Work in accordance with the plans and specifications to the satisfaction of the Engineer.

C. The price bid for MAINTENANCE AND PROTECTION OF TRAFFIC: TYPE A shall be a unit of EACH.

D. The price bid for MAINTENANCE AND PROTECTION OF TRAFFIC: TYPE B shall be a unit of EACH.

E. The price bid for MAINTENANCE AND PROTECTION OF TRAFFIC: TYPE C shall be a unit of EACH.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Manual on Uniform Traffic Control Devices (MUTCD)

1.05 REGULATORY COMPLIANCE

A. Contractor is responsible for obtaining all permits from appropriate agencies and utilities prior to commencement of Work. Contractor shall coordinate Work per NYCDOT requirements and shall prepare a Maintenance and Protection of Traffic Plan if so required by same.

B. The Contractor shall obtain all necessary permits for the closing of roads and shall comply with all laws or ordinances applicable to the Work under this Contract. Contractor shall pay for all service charges and permits at its own expense.

1.06 SUBMITTALS

A. The Contractor shall submit shop drawings as specified in DEP Standard Specifications for On-Site Green Infrastructure Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, proposed routes, manufacturer's descriptive literature, sign type and location, barrel / barrier locations, pedestrian crossings, and installation instructions.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MAINTENANCE TYPES

A. TYPE A: Street excavations for utilities, including water taps and connections to subsurface utilities.

B. TYPE B: Construction of sidewalks and/or street pavements or curbs. Also, shall include Work described under TYPE A, above.

C. TYPE C: Major malls, traffic triangles and/or public street constructions typically involving street closures, reconfigurations, and repaving. Also, shall include Work described under TYPE A and TYPE B, above.

D. The Contractor shall conduct his operations so as to interfere with traffic as little as possible, and effect, by every reasonable means, the safety and comfort of pedestrians, vehicles and vehicular passengers passing over or adjacent to the Site.

E. Under these items, subject to the approval of the Engineer, the Contractor shall perform the following:

1. TYPES A, B, and C: Keep the surface of all pavement used by the public free and clean of all dirt, debris, stones, timbers, snow and ice or other obstructions to provide a safe travelled way.

   Furnish, erect and place approved signs and cones for the directing of traffic, danger signs for curves, narrow pavement and other dangerous locations, and road closure signs.

   Provide watchmen and flagmen as necessary.

2. TYPES B and C: Furnish and erect barricades which shall be adequately lighted at night and on which red danger lights shall be displayed where needed.

   Furnish and erect temporary barricades and guide railing at points of hazard.

3. TYPE C: Provide concrete "jersey barriers," Impact Attenuator as necessary. Provide detours in street as necessary to reroute traffic.

2.02 SIGNS

A. The Contractor shall construct, erect, and maintain suitable signs for the direction and protection of traffic. These signs shall not only warn the traveler of the route or track to be followed in case of detours, but shall also warn of points of unusual danger. At points of termination of pavement, where shown on drawings or where required by the Engineer, signs of sizes indicated on plans shall be erected. Warning signs for termination of pavement shall be erected in advance of the point of pavement change as directed by the Engineer.

B. Signs required for maintenance of traffic shall be in accordance with the rules, regulations, and specifications of the Manual on Uniform Traffic Control Devices (MUTCD).

C. All barricades, danger signals, warning signs, indicators or obstructions not designed or suitable for use in the dark shall be removed from the roadway each evening by a time not later than one half (1/2) hour after sunset, as reported daily in newsprint referring to New York City, and the particular day in question, nor shall any obstructions as noted above be placed in the street earlier than one half (1/2) hour before sunrise.

D. When performing work during the dark hours, the Contractor shall use reflectorized barricades, reflectorized signs, illuminated devices, and suitable warning lights facing the approaching traffic to warn, direct and protect from damage vehicles, pedestrians, workmen and equipment. All such warning devices shall have the approval of the Engineer, and the Engineer shall prescribe the minimum requirements for each such warning device.

2.03 GENERAL

A. At least one flagman shall be required to be on duty for the direction of traffic during all working hours and one night watchman may be required to continuously patrol the contract to make sure that all signs are in place, all lights lighted, and all temporary timber curbing properly in place.

B. Danger signs shall be equipped with acetylene Gas Generating Units for such locations where electrical energy is not suitably available.

C. The Contractor shall furnish, erect, and install illuminated barricades when needed and as directed by the Engineer. The details of these may be shown on the plans.

D. Barricades shall be erected at points of abrupt changes in the direction of traffic, at points of similar hazard or where required by the Engineer. They shall be painted in alternate black and white stripes as directed by the Engineer or indicated on drawing.

E. When necessary to perform the Work and allow traffic to flow unimpeded, the Contractor shall install steel plates in the roadway in compliance with NYC DOT rules and as directed by the Engineer. Pursuant to NYC DOT rules all steel plates shall comply with the New York State Skid Resistance of 36 or greater, matching the existing adjacent surfaces of the roadway. The number of 36-skid resistance is determined by ASTM E274- (Skid resistance of paved surfaces using full scale tire test). In addition, the plates shall comply with the British Pendulum Test with a BPN of 55 or greater as determined by ASTM E303, latest revision. These test results numbers shall be maintained as long as the plates remain in the roadway.

F. The Contractor shall paint all barricades, signs and railings with two (2) coats of white paint, after which he shall apply one (1) coat of colored paint where shown on the plans or as directed by the Engineer.

G. Upon completion of the Work, all signs, barricades, and temporary curbing shall be removed from the site by the Contractor.

PART 3 EXECUTION

3.01 TRAFFIC CONTROL

A. Routes to and from the location of the Work shall be as indicated in the Contract or as directed by the Engineer. Temporary roadways shall be closed only with prior approval. All necessary permits and approvals shall be the responsibility of the Contractor.

B. All areas in which Work is to be done in the street/sidewalk shall be adequately barricaded and closed off before such Work is begun.

C. Contractor shall provide and keep in good condition all bridging and decking necessary to maintain vehicular and pedestrian traffic.

D. Provide authorized flag person as required for construction vehicle access and/or Work in the street/sidewalk.

E. Provide anti-tracking pads for exits from construction sites as indicated on the drawings.

F. Access to abutting driveways and entrances shall be provided at all times.

G. Only one crosswalk shall be closed at intersections at any time.

H. Upon completion of the Work, all signs, barricades, and temporary curbing shall be removed from the site by the Contractor.

CONTRACT GI-CONS-7
SECTION 01 55 26
TRAFFIC CONTROL

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 56 00
TEMPORARY BARRIERS AND ENCLOSURES

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall completely enclose, by temporary fences, all excavations, steep embankments, open shops, storage areas, and all other potentially hazardous locations as soon as such condition exists and as ordered by the Engineer. The fencing is in addition to any provisions that the Contractor would normally make to safeguard the Contractor's Work operations and in no way reduces the Contractor's obligations as provided in the Contract.

B. Under this item the Contractor shall furnish and install an 8'-0" high chain link Temporary Construction Fence on moveable footings using approved material and method to securely hold the fence in an upright position in accordance with the plans and, Specifications and as directed by the Engineer.

C. The following additional requirements shall also be provided:

1. New temporary fence protection shall be provided as required by any public or private entities sharing access with NYC Parks, and/or NYC Parks, the Building Code to protect the public, provide temporary construction fence to prevent all pedestrian, recreational and parking activities at work areas at the exterior of the building, including all areas of excavation.

2. Prior to beginning work, the Contractor shall survey the site to verify locations of all sidewalks, ramps, sitting service and parking areas.

3. The Contractor shall submit a layout plan for review and approval.

4. The layout plan shall also include areas for staging and hoisting, pre-approved by the NYC Parks Borough representative and the Engineer at the pre-construction meeting.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 14 00 – Work Restrictions

C. Section 01 41 00 – Regulatory Requirements

D. Section 01 57 13 – Temporary Erosion and Sediment Control

1.03 PAYMENT

A. The price for TEMPORARY CONSTRUCTION FENCE on moveable footings shall be a unit price per LINEAR FEET furnished and installed to the satisfaction of the Engineer, including gates.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM F 1083 – Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

B. ASTM A 392 / AASHTO M-181 Type 1 for fence fabric.

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures.

B. The product data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

C. Refer to additional requirements, including Contract Drawings, for work performed on New York City Department of Parks property listed in Section 01 14 00 – Work Restrictions.

D. Shop Drawings:

The Contractor shall provide a detailed drawing of the fence mounting and related accessories for approval by the Engineer prior to installation.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 TEMPORARY FENCING

A. FABRIC

Fabric shall be 2-inch diamond mesh, knuckled at the bottom and barbed at the top.

B. LINE POSTS, TERMINAL POSTS, BRACES, RAILS, AND FITTINGS AND HARDWARE

Dimensions (other than those shown on the plans), material sizes, material types, accessories, etc. shall be per the manufacturer.

C. GATES

Gates shall be of similar construction as the fence and shall be provided with locks. Gates shall be placed at locations as shown on the plans or as required by the Contractor and approved by the Engineer. The Engineer shall be supplied with a set of keys, one key for every lock.

D. SAND ANCHOR BAGS

Bags shall be heavy duty canvas; two bags required per moveable footing. Each bag shall contain forty pounds of sand.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. The Contractor shall be solely responsible for the furnishing, erecting, relocating, maintenance and removal and replacement of all temporary fencing required under this Contract. The Contractor shall maintain all fencing in a satisfactory and safe condition. The Contractor shall replace, at no additional cost to the City, any and all fencing that the Engineer deems cannot be maintained and/or fails to meet the requirements of this Section.

B. The Contractor shall be permitted to remove such portions of the fencing as are required for the purpose of performing the Contractor's construction operations during working hours, providing that the public is continuously safeguarded by other satisfactory means during these construction operations. In all such cases the sections of fencing removed must be restored to their original locations at the end of each workday.

3.02 INSTALLATION

A. The prefabricated fence panels shall be assembled in the field on moveable footings constructed of steel pipe rails. The fence panels shall be clamped together in the field and shall be installed in such a way that it will not tip or fall under windy conditions. The moveable footing shall be anchored with sand bags.

B. Contractor is responsible for restoration of any landscaping or pavement disturbed by fence or in areas adjacent to fencing, after removal of fencing is completed. The cost of the restoration shall be included under this item.

C. The Contractor shall maintain the chain link construction fence and gates during the life of this Contract and shall repair or replace all members that are disturbed, damaged, destroyed or vandalized at no cost to the City. Upon completion of the Work the fence

shall be removed and shall become the property of the Contractor.

END OF SECTION

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TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor must have an International Society of Arboriculture (ISA) certified arborist (Certified Arborist), as detailed below, present onsite during times of tree and shrub work, excavation and any other work that may be harmful to the condition and health of the vegetation.

The tree care company or individual performing the required work under this specification shall be certified by the New York State Department of Agriculture and Markets to perform pruning work within the Asian longhorned beetle quarantine zone. All pruning of limbs and roots must be performed by a qualified arborist trained in proper pruning techniques, tree biology, diagnosis and treatment of plant diseases, and cabling and bracing. The arborist shall have a minimum of three (3) years of experience performing non-utility pruning, as well as documentation of meeting education requirements as prescribed by the International Society of Arboriculture (ISA) or ISA certification. Certification by the International Society of Arboriculture (I.S.A.), Champaign, IL shall be considered proof of the requisite experience and educational requirements, provided that experience is in non-utility pruning.

B. All *Fraxinus* ssp (Ash) trees removed shall be handled as if infected with Emerald Ash Borer. The Contractor shall remove and dispose of woody material following NYSDEC guidance and regulations.

C. The Certified Arborist will advise and oversee excavation Work around existing trees under all stages of Work. For trees under the jurisdiction of the New York City Department of Parks and Recreation (NYC Parks) the certified arborist shall coordinate with NYC Parks' Borough Forester prior to completing excavation, pruning, removal, or other work that may be harmful to the condition and health of trees. The Certified Arborist will ensure all Work is done to industry standards, following NYC Parks protocol where applicable.

D. DEP may engage an independent Consulting Arborist, to observe, coordinate, and direct the Contractor's Certified Arborist. Neither the Contractor nor the Certified Arborist are responsible for providing a Consulting Arborist.

E. The Contractor is responsible for coordinating between their Certified Arborist, DEP's Consulting Arborist, and NYC Parks Borough Forester. Prior to initiating any site work the contractor shall complete a site meeting to review all tree work, tree impacts, and items of work that require attendance by the Certified Arborist, DEP's Consulting Arborist, and/or NYC Parks Borough Forester.

F. The Contractor's arborist subcontractor shall decompact soil around trees over 6” to 12” DBH, in accordance with the plans, specifications, and as directed by the Certified Arborist, and/or the DEP Project Manager.

1. DBH is defined as Diameter at Breast Height, which is 4 feet 6 inches above mean grade.

G. The Contractor shall perform hand removal of pavements in accordance with the plans, specifications, and directions of the Certified Arborist.

H. The Contractor shall perform hand excavation in accordance with the requirements of Section 31 23 16 – Excavation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 - Submittal Procedures

B. Section 31 23 16 - Excavation

C. Section 32 90 00 - Planting

1.03 PAYMENT

A. The price bid for WOODEN TREE GUARD shall be a unit price for EACH tree protected and shall cover the cost of furnishing all labor, materials, equipment, insurance and incidentals required to construct, maintain and remove the barrier in locations as directed by the Engineer and in accordance with the Contract Drawings.

B. The price bid for TREE PROTECTIVE FENCE FOR GROVES shall be a unit price per LINEAR FEET of tree guard furnished, erected and removed and shall include the cost of all labor, materials, equipment and expenses necessary to furnish, erect and remove the tree guards, including line post/stakes, HDPE mesh, all hardware and tying of tree branches, all in accordance with the contract drawings and in accordance with these specifications, to the satisfaction of the Engineer.

D. The price bid to PROTECT EXISTING TREE ROOTS WITH PLYWOOD OR MATS shall be a unit price per SQUARE FEET measured in place, and shall include the cost of all labor, materials and equipment for protection of existing tree roots, including: plywood or ground protection mats; 6-inch depth woodchips; landscape fabric; saw cutting; corrosion resistant hardware; relocating, replacing and removing plywood or ground protection mats as directed by the Engineer; and all incidental expenses necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

E. The price bid to PROTECT EXISTING TREE ROOTS WITH WOODCHIPS - 6" DEPTH shall be a unit price per SQUARE FEET of woodchips furnished and installed in tree root

areas and shall include the cost of all labor, materials and equipment necessary to furnish, remove and dispose of wood chips in accordance with the plans and Specifications, to the satisfaction of the Engineer.

F. The price bid for TREE REMOVAL OVER 6" TO 12" DBH shall be a unit price for EACH tree removed in the OVER 6" to 12" DBH size group (equivalent to one tree unit) and shall include the cost of all labor, materials, and equipment necessary for decompacting trees by either vertical mulching, radial trenching, or air-tilling the critical root zone as directed and other incidentals necessary to complete the work including compost and watering, in accordance with the plans and Specifications, to the satisfaction of the Engineer.

G. The price bid for TREE REMOVAL OVER 12" TO 18" DBH shall be a unit price for EACH tree removed in the OVER 12" to 18" DBH size group (equivalent to one tree unit) and shall include the cost of all labor, materials, and equipment necessary for decompacting trees by either vertical mulching, radial trenching, or air-tilling the critical root zone as directed and other incidentals necessary to complete the work including compost and watering, in accordance with the plans and Specifications, to the satisfaction of the Engineer.

H. The price bid for TREE REMOVAL OVER 18" TO 24" DBH shall be a unit price for EACH tree removed in the OVER 12" to 24" DBH size group (equivalent to one tree unit) and shall include the cost of all labor, materials, and equipment necessary for decompacting trees by either vertical mulching, radial trenching, or air-tilling the critical root zone as directed and other incidentals necessary to complete the work including compost and watering, in accordance with the plans and Specifications, to the satisfaction of the Engineer.

I. The price bid for STUMP REMOVAL shall be a unit price for EACH stump removed in the OVER 6" to 12" size group (equivalent to one stump unit), and shall include the cost of all labor, materials, and equipment necessary for removing the stump, including disposal of all debris, chipping of wood waste, and all other incidentals necessary to complete the work, in accordance with the plans and specifications, to the satisfaction of the Engineer.

J. The price bid for PREPARATORY PRUNING OF TREE UNDER 12" DBH shall be a unit price for EACH tree pruned in the UNDER12" DBH size group (equivalent to one tree unit), and shall include the cost of all labor, materials, and equipment necessary for pruning trees, including disposal of all debris, chipping of wood waste, and all other incidentals necessary to complete the work, in accordance with the plans and specifications, to the satisfaction of the Engineer.

K. The price bid for PREPARATORY PRUNING OF TREE OVER 12" TO 18" DBH shall be a unit price for EACH tree pruned in the OVER 12" to 18" DBH size group (equivalent to one tree unit), and shall include the cost of all labor, materials, and equipment necessary for pruning trees, including disposal of all debris, chipping of wood waste, and all other

incidentals necessary to complete the work, in accordance with the plans and specifications, to the satisfaction of the Engineer.

L. The price bid for PREPARATORY PRUNING OF TREE OVER 18" TO 24" DBH shall be a unit price for EACH tree pruned in the 18" TO 24" DBH size group (equivalent to one tree unit), and shall include the cost of all labor, materials, and equipment necessary for pruning trees, including disposal of all debris, chipping of wood waste, and all other incidentals necessary to complete the work, in accordance with the plans and specifications, to the satisfaction of the Engineer.

M. The price bid for PREPARATORY PRUNING OF TREE 24” DBH AND OVER shall be a unit price for EACH tree pruned in the 24” DBH AND OVER size group (equivalent to one tree unit), and shall include the cost of all labor, materials, and equipment necessary for pruning trees, including disposal of all debris, chipping of wood waste, and all other incidentals necessary to complete the work, in accordance with the plans and specifications, to the satisfaction of the Engineer.

When directed by NYC Parks Borough Forestry, a tree branch may need to be tied back to facilitate adjacent construction operations. Materials for tying back limbs shall be selected to minimize damage and abrasion to branches and bark and must be approved by the NYC Parks Borough Forestry prior to use. The Contractor will be paid 0.50 tree units for each branch tied back.

N. The price bid for DECOMPACT TREE OVER 6" TO 12" DBH shall be a unit price for EACH tree decompacted in the OVER 6” to 12” DBH size group (equivalent to one tree unit) and shall include the cost of all labor, materials, and equipment necessary for decompacting trees by either vertical mulching, radial trenching, or air-tilling the critical root zone as directed and other incidentals necessary to complete the work including compost and watering, in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. International Society of Arboriculture Appraisal Method

1.05 REGULATORY COMPLIANCE

A. New York City Administrative Code Local Law 3 Section 18

1.06 SUBMITTALS

A. Arborist Subcontractor Qualifications: The Contractor shall submit to DEP and NYC Parks, on behalf of the arborist subcontractor, references from at least four (4) previous jobs, ongoing or completed within the past three (3) years, with work of a similar scope and magnitude to the Work necessary under this Contract, International Society of Arboriculture (I.S.A.) certification or equivalent experience as detailed above, and

documentation of three (3) years of full time experience in arboriculture. The core business of the arborist subcontractor must be relevant to the Work described in this specification. For each project, include the following information (at a minimum):

1. Project name, client contact information (name, title, phone #);

2. Description of the firm's role in the project (e.g., prime, member of joint venture, or subconsultant) and its specific responsibilities on the project;

3. The project's total value;

4. Time period on job (year started and completed – or if on-going);

5. Brief description of the work and its relevance to this project.

B. The Contractor is responsible for the formulation of a Tree Protection Plan in consultation with the Certified Arborist when Work, including access and staging, will occur within fifty feet of any tree under NYC Parks jurisdiction or on City owned property.

C. Qualifications in Quarantine Zone: State Certification for all contracts within the Asian Longhorned Beetle Quarantine Zone, the Sub/Contract must submit a copy of a valid Compliance Agreement issued by the State of New York Department of Agriculture and Markets, Division of Plant Industry.

1.07 QUALITY CONTROL (NOT USED)

1.08 TREE PROTECTION PLAN

A. The Tree Protection Plan should include, but not necessarily be limited to, the location of pavements to be removed within critical root zones, temporary wooden tree guards, construction fence or temporary snow fence boundaries, areas to be excavated by hand and/or pneumatic methods, soil compaction prevention and mitigation requirements, and impacts of trenching and/or cut and fill operations.

1. In addition, the plan should address the Contractor's operations, including designated staging areas, Site access and stockpiling of materials.

B. Mandatory provisions of the Tree Protection Plan include, but are not limited to, the following provisions:

1. The Contractor shall not be permitted to park vehicles or equipment or to stockpile materials of any nature under the drip line of trees or shrubs in order to minimize surface and subsurface root damage and soil compaction. This directive shall apply to all areas within or outside the contract limit line.

2. All tree pruning, tree removal and soil decompaction is to be performed by the arborist subcontractor. From the arborist subcontractor, at least one person per each crew must hold a current certification from the ISA. See arborist subcontractor qualifications above.

3. All contact between equipment and overhead tree limbs should be avoided. Bending or breakage of limbs is prohibited. If clearance pruning is proposed, the Work will not take place without the written permission of the NYC Parks Borough Forester, and then will only be performed with professional equipment as per the NYC Parks' standards and specifications for such Work.

4. All trees within or adjacent to the limits of disturbance are to receive at least one (1) inch (the equivalent of 750 gallons of water per 1000 square feet of tree protection zone) of water per week between the months of March and October as directed by the Certified Arborist and/or the NYC Parks Borough Forester. If rainwater in any given week is below this quantity, the Contractor must supplement the amount received by utilizing soaker hoses or as directed by the Certified Arborist and/or NYC Parks Borough Forester. If a water source is unavailable at the Site, then the Contractor must provide tree irrigation bags or a water truck to apply the requisite amount of water.

5. Where excavations occur within the critical root zone for the removal of existing features or installations of new Work, the excavated area must be backfilled immediately. Where exposed roots cannot be backfilled immediately the Contractor may, for a period of time not exceeding forty-eight (48) hours, treat roots by covering them with moistened fabric or burlap covered with white plastic. This treatment must be checked a minimum of two (2) times a day to ensure that roots are kept moist at all times. These checks are to occur once in the morning and once in the afternoon. If directed by the Certified Arborist and/or the NYC Parks Borough Forester, soaker hoses must be installed to facilitate adequately moist conditions. No pooling of water or continuous running water must occur within the critical root zones other than that during the irrigation process.

6. Any excavation within the critical root zone as indicated on the plans or by the Certified Arborist will be performed by hand. This Work includes but is not limited to the breaking of concrete or asphalt with a pneumatic (jack) hammer and excavation of soils/fill with pneumatic tools (air spade or air knife) or shovel, or approved equivalent. All excavation within the critical root zone must be performed under the supervision of a Certified Arborist.

7. The Contractor shall exercise extreme care in removing concrete or asphalt within the tree protection zone, lifting rather than dragging paving pieces. Tools and equipment for this activity must be approved by the Certified Arborist of DEP or the NYC Parks Borough Forester prior to the start of excavation.

8. If directed by the Certified Arborist and/or the NYC Parks Borough Forester, the critical root zone of a tree will be covered with woodchips to a depth of at least six (6) inches in order to protect roots from damage caused by heavy equipment. Such covering will be maintained during the course of construction and removed after the end of construction. Removal will be by hand or as specified by the Certified Arborist and/or NYC Parks Borough Forester.

9. Roots over 1" in diameter must not be cut without the written permission of the NYC Parks Borough Forester or their designated representative.

10. Protective fencing, pruning, tree guards, woodchips will be paid for separately as per the drawings or as directed by the NYC Parks Borough Forester or Project Manager.

11. Tree guards with tree wraps as specified by the NYC Parks will be installed on all trees within or adjacent to the limits of disturbance as directed by the Certified Arborist or NYC Parks Borough Forester. Protective fencing will be installed along the perimeter of the tree protection zones for individual trees or groups of trees within or adjacent to the limits of disturbance or as directed by the Certified Arborist or NYC Parks Borough Forester.

12. Fencing material will follow NYC Parks specifications and standards and will be construction (chain link) fencing or orange polyethylene (snow) fencings or range fencing, as specified by the DEP. The minimum height of fencing shall be four (4) feet.

13. Fences and tree guards will not be removed or moved without written permission of the Certified Arborist or the NYC Parks Borough Forester.

14. All tree protection fenced zones will be so indicated with signage with wording "Tree Protection Zone" posted visibly on the fenced in area as directed by the Certified Arborist or the NYC Parks Borough Forester.

15. Planting beds within critical root zones may only be installed in the presence of the Certified Arborist or the NYC Parks Borough Forester. All excavation and plant installation is to be done by hand, with minimal soil disturbance. No roots within the critical root zone shall be cut without the written authorization of the NYC Parks Borough Forester. Plants must not be placed within three (3) feet of the tree trunk unless directed by the Certified Arborist or NYC Parks Borough Forester.

1.09 REMEDIATION

A. In the event of damages to trees and shrubs resulting from the Contractor's Work, as determined by the NYC Parks Borough Forester, the following will apply:

1. At the completion of the construction project and in response to field conditions, any of the following Site restoration/mitigation measures may be required by the NYC Parks in addition to those specified in the Tree Protection Plan. These measures will be at the expense of the Contractor and will not be done without the approval of the NYC Parks Borough Forester.

   a. Decompact soil around tree.

   b. Hand Removal of Pavements.

   c. Pneumatic excavation.

   d. Pruning of dead or diseased tree branches.

   e. Root collar excavation, to remove any soil that accumulated around the base of the tree during construction.

   f. Tree irrigation, for up to one (1) year after the end of construction. Method is to be as directed by the NYC Park's Director of Tree Preservation or their designated representative or as per the applicable specification.

   g. Soil replacement in eroded areas.

   h. Root pruning.

   i. Bark tracing.

PART 2 PRODUCTS

2.01 WOODEN TREE GUARD AND TREE PROTECTIVE FENCE FOR GROVES

A. Wooden Tree Guard: Lumber shall be Yellow Pine, Douglas fir, or Spruce of the dimensions shown on plans. Nails shall be galvanized. No paint will be required. All work shall be done in a neat and workmanlike manner to the satisfaction of the Engineer.

1. High Density Polyethylene (HDPE) mesh: Color to be orange.

2. Line Post/Stake: Line post/Stake shall be steel post anchor with cap.

3. Standard Scaffold Poles and Scaffold Clamps: Color to be black or dark green.

2.02 PLYWOOD

A. Shall be new or gently used four foot by eight foot sheets with a minimum thickness of one half inch. Hardware to fasten plywood sheets shall be corrosion resistant steel. Chromated Copper Arsenate (CCA) treated lumber is not acceptable for this work.

Due to inferior performance in wet conditions, oriented strand board (OSB) is not acceptable under this Specification.

2.03 GROUND SURFACE PROTECTION MAT

A. Shall be manufactured from HDPE, one half inch thick minimum, measure approximately four foot by eight foot, equipped with a lip on two sides that creates an overlapping joint with an adjoining mat to allow for effective load distribution between mats, have an interlocking mechanism consisting of multiple connection points uniformly spaced along the full length of the overlapping lips of adjacent mats with fixed locking pins, and a potential load bearing capacity of at least sixty tons dependent upon sub-surface properties. Mats shall be similar to "Dura Deck" as manufactured by Signature Systems Group, NY, NY, or "AlturnaMATS" as manufactured by Alturnamats, Inc., Titusville, PA, or approved equal.

2.04 WOODCHIPS

A. Woodchips shall be clean chips free of any deleterious material such as ash or insecticide. Chips may be of any wood except wood waste generated from an Asian Longhorned beetle infestation or an Emerald Ash borer infestation. Wood chips produced on the site through authorized pruning and tree removal may also be used for this work. Chips shall be derived from tree material, not from wood waste or by-products like sawdust, shredded palettes, or other debris.

2.05 LANDSCAPE FABRIC

A. Landscape Fabric shall be a one hundred (100%) percent continuous monofilament polypropylene spun bond fabric with UV inhibitors, such as DeepRoot Xavan®, as manufactured by DuPont, Ontario, CA, available from the subsidiary company DeepRoot Partners, LP, San Francisco, CA, No. 3201 as manufactured by Typar, Old Hickory, TN, or approved equal. The landscape fabric shall prevent weed germination and reduce maintenance while allowing water, herbicides, and fertilizers to pass through. The fabric shall demonstrate the following minimum characteristics:

- Area Weight (ASTM 5261): 4.0 oz/yard
- Tensile Strength (ASTM D 4595): 48.57 lbs./inch
- Strength @ 5% Elongation: 22.86 lbs./inch
- Energy absorption: 22 lbs./inch
- Grab Strength (ASTM D 4632): 167.42 psi
- Burst Strength (ASTM D 3786): 166.79 psi
- Tear Strength (ASTM D 4533): 83.15 lbs.
- Puncture (ASTM D 4833): 56.18 lbs.
- Hydraulic Properties: Opening size (ASTM D 4751) 210 microns; US Sieve 70

B. Staples shall be at least six (6") inches in length and made of a rust-resistant material, such as aluminum, galvanized steel, or approved equal that will adequately secure the landscape fabric to the planting bed.

PART 3 EXECUTION

3.01 WOODEN TREE GUARD

A. The temporary wooden tree guards shall be installed where shown on the Contract Drawings and meet the requirements of the Contract Documents. Posts shall be installed at approximately eight feet on center, unless otherwise noted on the plans or directed by the Engineer. They shall be installed without damage to existing trees. If any temporary wooden tree guards are damaged during the course of the work, they shall be immediately repaired, or replaced by a new temporary wooden tree guard at no additional expense.

1. HDPE mesh shall be attached to outside of tree guard, straight and taut, with no stretching or sagging, and secured using galvanized wire or staples. Work is to be done in a neat and workmanlike manner. All extra mesh shall be trimmed or properly secured.

2. Temporary wooden tree guards shall remain in place and not be moved or removed without written permission of the NYC Parks or its designated representative until all work which might cause damage or defacement has been completed. Upon completion of the work, to the satisfaction of the Engineer, the Contractor shall remove and dispose of all temporary wooden tree guards.

3.02 TREE PROTECTIVE FENCE FOR GROVES

A. The Contractor shall install posts at approximately eight feet on center, unless otherwise noted on the Contract Drawings or directed by the Engineer. Post shall be driven a minimum of two (2') feet into the ground, or as directed by the Borough Forester, without damage to existing trees or tree roots.

1. HDPE mesh shall be attached to the outside of the posts, straight and taut, with no stretching or sagging, and secured using galvanized wire. Work is to be done in a neat and workmanlike manner. All extra mesh shall be trimmed and properly secured.

2. Temporary wooden tree guards shall remain in place and not be moved or removed without written permission of the NYC Parks or its designated representative until all work which might cause damage or defacement has been completed. Upon completion of the work, to the satisfaction of the Engineer, the Contractor shall remove and dispose of all temporary wooden tree guards.

3.03 PROTECT EXISTING TREE ROOTS W/PLYWOOD OR MATS

A. The Contractor shall place plywood sheets and/or ground surface protection mats in areas shown on the drawings and as directed by the Engineer. The Borough Forester t shall inspect the work and approve the work as required to assure tree root protection. The Contractor shall sawcut and fasten plywood sheets if necessary, to fit into tree root areas. The Contractor shall place and fasten ground surface protection mats throughout the tree root areas as shown on the tree protection plan. Plywood/Ground surface protection mats shall remain in place and not be moved or removed without written permission granted by Borough Forester until all work which might cause compaction or root damage has been completed.

B. If any plywood/ground surface protection mat is dislocated, damaged, or destroyed during the course of the work, it shall be immediately replaced by new or gently used plywood/ground surface protection mat within 48 hours of notification at no additional cost to the City. All hardware shall be removed from the site when plywood/ground surface protection mat is relocated or removed. Plywood sheets/ground surface protection mats and all associated hardware shall be removed as necessary to facilitate construction and when they are no longer required on site as determined by the Engineer. If any trees are damaged during removal, remediation measures as required by the NYC Parks Borough Forester shall be implemented by the Contractor at no additional cost to the City. Plywood sheets/Ground surface protection mats shall be the property of the Contractor.

3.04 PROTECT EXISTING TREE ROOTS W/ WOOD CHIPS

A. Wood Chips for temporary tree root protection during construction shall be applied by hand to the surface of the tree protection area as shown on the plans or as directed by the Engineer in consultation with a representative of the Borough Forester. Woodchips shall be applied to a uniform depth of six (6”) inches over the entire area and shall be so distributed as to create a smooth level cover. Borough Forester shall inspect the work and approve the work, as required to assure tree root protection.

B. Maintenance of six (6”) inch depth: If any wood chips are dislocated or depleted during the course of the work, they shall be immediately replaced with new wood chips within 24hours of notification at no additional cost to the City.

C. Removal: At the completion of the Work, unless otherwise directed by the Engineer, the Contractor shall remove the wood chips and landscape fabric by hand. Wood Chips to protect existing roots shall remain in place and not be moved or removed without written permission of the Engineer until all work which might cause soil compaction or root damage has been completed.

The Contractor may submit a written request to remove by machine to the Landscape Construction Unit (NYC Parks Department). No machine removal shall be allowed without prior approval and supervision by the Borough Forester. Upon completion of the work, the wood chips shall be removed by the contractor.

3.05 TREE REMOVAL

A. The Contractor shall carefully protect against damage all existing trees, plants, and other features to remain. The Contractor shall be liable for any damage to such trees, plants, park features, and other property caused by the Tree removal operations and all damaged property shall be replaced or restored to its original conditions, to the satisfaction of the Engineer.

1. The Contractor shall cut and remove all trees designed for removal within the limits of the contract or as directed by the Engineer.

2. All voids and excavations left after removal of the tree and roots shall be backfilled to grade with clean fill. The fill shall be placed and compacted by acceptable methods to the satisfaction of the Engineer. Chips generated by root removal operations shall be removed prior to backfilling.

3. For trees designated for removal with stump to remain, the stumps of these trees shall be cut flush to ground surface.

4. Cutting of trees shall be done by competent workmen only and in workmanlike manner. All trees shall be “topped” and “limbed” previous to felling unless otherwise directed by the Engineer. All branches, limbs, trunks, stumps, roots and other debris shall be removed from the site or otherwise disposed of to the satisfaction of the Engineer.

5. No trees are to be removed except as ordered by the Engineer.

3.06 STUMP REMOVAL OVER 6” to 12” IN DIAMETER

A. The Contractor shall remove and dispose of designated exiting stumps over six (6) inches in diameter. All Work shall be performed in accordance with the Contract documents by experienced workmen to the satisfaction of the Engineer.

1. Stumps and roots shall be excavated to a depth of three (3) feet. All voids and excavations left after the removal of the stump and roots shall be backfilled to grade with clean earth fill. The fill shall be placed and compacted by acceptable methods to the satisfaction of the Engineer. Chips generated by stump removal operations shall be removed prior to backfilling.

2. If, when removing the stumps, existing walks or curbs are disturbed, the Contractor shall restore and/or reset these walks and curbs, at no additional cost, to the satisfaction of the Engineer. The Contractor is responsible for locating and protecting underground utilities from damage during excavation and/or grinding of stumps.

B. Special Requirements for Longhorned Beetle Quarantine Zone: For tree work to be performed within the quarantine zone, the Contractor shall utilize the service of a sub/contractor certified by the New York State Department of Agriculture and Markets. Due to current Federal, State and NYC Parks policy, any wood waste that is generated must be completely chipped within the Quarantine Zone, by said certified sub/contractor. Log splitting equipment, where necessary, shall be utilized at no extra cost to the City. For additional information regarding procedures, the Contractor shall notify the Borough Forester a minimum of 48 hours in advance of any Work.

3.07 TREE PRUNING

A. The Contractor shall follow recognized and accepted arboricultural standards and existing City, State and Federal regulations. Pruning shall be performed without injury to trees and preserving, if possible, the tree's natural growth pattern. All Work shall be performed to the satisfaction of the DEP and in the order directed by the Borough Forester.

Assigned trees shall not be skipped. Trees that have recently been pruned before this Contract or trees that do not require pruning as determined by the Borough Forester are not part of this Contract regardless of assignment. Undersized trees shall not be pruned regardless of assignment. Trees previously tagged for removal shall not be pruned regardless of assignment unless specified by the Borough Forester as a utility topping pruning item.

All assigned trees, six (6) inches in diameter and over, measured at the height of four and a half (4.5) feet from the ground, shall be pruned, except for those described above. In the event the contractor prunes those unlisted or undersized trees, listed in error by NYC Parks, no payment will be made.

All pruning shall be completed to current best practice for either branch removal cuts (thinning cuts) or reduction cuts (lateral cuts or drop crotch cuts) and must preclude clearance requirements specified elsewhere in this contract. Do not leave stubs and do not cut off or cut into the branch collar. When removing a dead branch, the final cut should be made just outside the collar of living tissue. All limbs one inch (1") in diameter (the size of a quarter) and over must be pre-cut to prevent splitting and/or bark rips. No more than 25% (percent) of the live crown of a single tree should ever be removed in a single pruning event.

If in the Contractor's reasonable determination, the condition of a tree warrants more extensive work than is required under the scope of this Contract and the tree needs a further assessment by a NYC Parks' Borough Forester, then the Contractor shall notify DEP for follow-up with NYC Parks. The Contractor shall report all health conditions and structural defects that require mitigation to the DEP for follow up with NYC Parks Borough Forester.

B. TREE PRUNING FOUR (4) INCHES IN DIAMETER AND OVER

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TEMPORARY TREE AND PLANT PROTECTION

At each marked tree location, the Contractor shall perform some or all of the following pruning work as directed by the Borough Forester. Pruning objective and method will be directed by the Borough Forester.

The Borough Forester may specify one or more of the following objectives, or may assign alternate objectives not listed here:

- Manage risk; health; size or shape; wildlife habitat; and/or to improve aesthetics;

- Develop structure, such as to: improve overall branch and trunk architecture; promote or subordinate certain leaders, stems, or branches; promote desirable branch spacing; promote or discourage growth in a particular direction (directional pruning); minimize conflict with traffic or infrastructure; restore plants following damage;

- Provide clearance, such as to: ensure safe and reliable utility house connection services; prevent interference with infrastructure, buildings, or other plants; raise crown(s) for movement of traffic or light penetration; ensure lines-of-sight or desired views; provide access to sites, buildings, or other structures; and/or, comply with regulations.

The Borough Forester may specify one or more of the following methods to achieve the objective(s):

- **Structural Pruning:** Shall consist of selective pruning to improve tree and branch architecture primarily on young and medium aged trees by selecting a dominant leader and removing or reducing competing leaders, removing intertwining branches, interfering, overextended, defective, weak, and poorly attached branches shall be removed or reduced.

- **Crown Cleaning** to selectively remove dead, broken, cracked, detached, crossing, rubbing, damaged (storm or otherwise), fungus and insect infected branches, dead or decaying stubs, suckers and all other undesirable growth one and a half (1.5) inch diameter and larger and foreign objects. Injured areas not compartmentalizing properly may be bark traced in accordance with accepted arboricultural practices.

- **Crown Thinning** to selectively prune for improved light penetration and/or air penetration, reduce. canopy density and reduce load on limbs. The percentage of live foliage removed must not exceed 20%. In most cases, the majority of live foliage removed is from the outer third of the crown. Only remove branches up to one-half (1/2) · inch in diameter on young, immature, or semi-mature trees (size classes 1 through 3) and up to two and a half (2 1/2) inches in diameter on semi-mature, mature, and over- mature trees (size classes 4 and 5).

- **Crown Raising** to provide vertical clearance from vehicles, pedestrians, signs, buildings, lights, and fire transmission lines. This work may involve both the

removal and shortening of limbs. Branches greater than half of the trunk diameter should not be removed. Live crown to clear trunk ratio should never be less than 50%. Unless otherwise directed, the canopy should be raised to 15 feet over roads, eight (8) feet over sidewalks and pruned to give ten (10) feet clearance from buildings, permanent structures, fences and ten (10) feet of clearance around all sides of electrical "house service" wire from pole/ secondary wires to building.

- **Crown Reduction** cuts (lateral cuts or drop-crotch cuts) should be to a lateral branch at least one-third (1/3) to one half (1/2) the diameter of the removed portion. Building clearance shall be at least ten (10) feet.

- **Utility Topping** to limit branches to a minimum of 10 feet below secondary and primary electrical transmission and distribution lines, including "house service" wires. Branches should be reduced to lateral branches or removed to parent stems growing outside and/or away from the clearance area (directional pruning). Branch removal or reduction cuts should be made beyond the 10 foot clearance distance at an appropriate branch union. When no appropriate branch union is present a heading cut can be used. The heading cut will leave a stub. Utility topping should not be performed during active storm conditions. The utility topping prescription shall be invoiced using Items 6-10.

- **Crown Restoration** to remove branches, sprouts, and stubs from trees that have been topped, severely headed, vandalized, lion tailed, broken in a storm, or otherwise damaged.

Unacceptable Pruning practices:

- **Over-thinning and Crown Shape**: Excessive branch removal on the lower two thirds of any branch or stem (also known as "lion tailing" or "over-thinning") is not acceptable and will result in disciplinary action being taken by the Agency. Proper thinning retains crown shape and should result in an even distribution of branches throughout the crown.
- **Topping and heading cuts:** Topping is the excessive reduction of tree size by cutting to stubs (heading) without regard for long-term tree health or structural integrity. Unless specifically directed to undertake such work on an individual tree(s) by the Borough Forester, topping is an unacceptable practice and will result in disciplinary action being taken by the Agency. Limited heading cuts are acceptable in some circumstances such as: structural development; mitigating risk, where reduction to suitable lateral branches is not practical; restoration or rejuvenation; and, to avoid making unnecessarily large branch removal cuts during utility clearance pruning.

The Contractor shall carefully protect against damage to all existing trees, plants, other growths and other features to remain. He/she shall be liable for any and all damage to such

trees, plants, other growths, real property and vehicles. The Contractor shall replace any injured trees as per the instructions of the Borough Forester.

Where appropriate, the Contractor shall use ropes to lower any branch that would injure the tree or other property when falling. Any structurally weak, decayed trunk or branch, or split crotch or branch, shall be removed. The Contractor shall remove all crossed or rubbing branches where practicable as long as the removal will not leave large holes in the general outline of the tree.

In the case of locations with restricted access, parked cars, or where listed trees are taller than the working height of a bucket, trees shall be pruned using ropes and saddles. The uses of hydraulic limb loppers or climbing spikes are not acceptable. In the event hydraulic limb or climbing spikes are used, no credit will be given for pruning said trees. Their use will also be grounds for default proceedings.

3.08 DECOMPACT SOIL AROUND TREE OVER 6” TO 12” DBH

A. Before any pruning Work can begin under this item, the NYC Parks Borough Forestry office must be notified a minimum of forty-eight (48) hours prior to beginning Work. NYC Parks Borough Forestry office contacts are as follows:

1. Bronx: (718) 430-1877

2. Brooklyn: (718) 965-7750

3. Manhattan: (212) 860-1845

4. Queens: (718) 393-7373

5. Staten Island: (718) 390-2080

B. Where specified, existing trees to remain will be have the soil surrounding the tree decompacted after completion of construction operations including excavation, paving, pruning, and backfilling. Decompaction will be performed utilizing one of the three methods listed below as shown on the contract tree protection plan or as determined by the supervising Certified Arborist or the NYC Parks Borough Forester. All tree root protection must be removed prior to starting soil decompaction and decompaction must not be performed in frozen ground conditions.

1. Air-Tilling of the Critical Root Zone Method: Using a pneumatic device, the area within a 3 to 5 foot radius of the tree stem, and specified on the Tree Protection Plan, is to be tilled to a depth of 6 to 8-inches using a compressed air gun. Compost backfill must be applied to the area at a depth of 1-inch and tilled into the soil using a compressed air gun. The area will be top dressed with four-inches (4”) of shredded bark mulch and thoroughly watered (paid under a separate item).

2. Radial Trenching Method: Using a pneumatic device, narrow trenches, 18 to 24-inches wide, will be cut in a radial pattern throughout the root zone. These trenches appear similar to the spokes of a wagon wheel. The trenches will begin two (2') feet from the trunk of the tree and between buttress roots to avoid cutting any major support roots. The trenches should extend at least as far as the dripline of the tree. The trenches shall be 8-12 inches in depth. Compost backfill must be used to fill the trenches. Where required, fertilizer may be mixed with the compost and applied. The area must be thoroughly watered after completion.

3. Vertical Mulching Method: Three inch (3") diameter holes must be excavated 12" deep, spaced 30" on center in a grid pattern throughout the root zone of the tree. Proposed tools and methodology for this Work must be submitted and approved by the NYC Parks Director of Capital Arboriculture and Horticulture or his or her designated representative. Compost backfill must be used to fill the holes and the area must be thoroughly watered after completion.

Tree DBH	Number of 3" Dia. Holes		
0-6"	40	30-36"	160
6-12"	60	36-42"	180
12-18"	80	42-48"	200
18-24"	100	over 48"	220
24-30"	120		

C. Where a pneumatic device is required, Work must be performed with a device such as an Air-Spade® CGP System, as manufactured by Concept Engineering Group, Inc. Verona, PA, or approved equal. The Contractor shall provide a compressor unit for operating the pneumatic excavator rated at one hundred fifty standard cubic feet per minute (150 scfm) at ninety pounds per square foot gauge (90 psfg). Different nozzles may be used on the air spade to expedite the Work or minimize the amount of airborne material. Where a pneumatic device is used, care must be taken to avoid rocks being scattered and inadvertently damaging private or public property. In addition, operators must be equipped with adequate protective clothing and gear, in accordance with manufacturer's recommendations. All tree roots exposed by the pneumatic or hand excavation operation must be kept constantly moist with burlap covered with white plastic and checked a minimum of two (2) times a day, once in the morning and once in the afternoon, for a maximum of forty-eight (48) hours, until backfill is complete as directed by the supervising Certified Arborist.

D. Watering: Watering must take place at one-week intervals for a period of three weeks following decompaction at a rate of 750 gallons of water per 1000 square feet of decompacted area. The supervising Certified Arborist may order less watering based on weather conditions, resulting soil water content or other factors. If drought conditions warrant, supervising Certified Arborist may order more frequent watering than scheduled

or during non-scheduled periods. A watering schedule must be submitted to supervising Certified Arborist each week.

E. Watering for trees must be conducted by dispersing water to plants individually. Water must be delivered to each plant under low pressure through the end of an appropriate sized hose or watering wand, or soaker hose anchored by pins where appropriate. The rate of watering should allow maximum penetration of water into the soil and at a rate that does not displace mulch or soil, cause uprooting or exposure of plant root to the air or break saucers around plants that were created to hold water.

F. Water must not be applied in a manner which damages plants, plant saucers, stakes or adjacent areas. Each plant saucer must be carefully filled with water in a manner which does not erode the soil or the plant saucer. Watering must not cause uprooting or exposure of plant‘s roots to the air. Damages resulting from these operations must be immediately repaired at the Contractor’s expense.

G. Where water is supplied from City hydrants, the Contractor shall request in writing to DEP’s Bureau of Water Sewer Operations (BWSO) to obtain a hydrant use permit. Permits are issued for a 30-day period, and the Contractor is responsible for keeping the permits current.

3.09 HAND REMOVAL OF PAVEMENTS

A. The intent of the item is to break up and carefully remove pavements with a pneumatic (jack) hammer in areas where trenching or other excavation is required within the critical root zone of existing trees and/or sensitive areas. These are areas, where in the opinion of the Certified Arborist, use of a backhoe or tractor would not be appropriate.

B. All unit masonry foundations such as brick and concrete block, and all other materials which can be removed with equipment performing normal excavation operations, will be excluded from this item. This Work will be paid for under the bid sheet item "Unclassified Excavation".

C. The Contractor shall verify all dimensions and conditions in the field and shall be responsible for the same. The Contractor shall demolish and carefully remove pavements as indicated on the plans and as directed by the Certified Arborist.

D. All material shall be removed from the Site at no additional cost to the City.

E. In the event the Contractor encounters any utilities or services during the performance of the Work, he shall notify the City Department or Utility Company owning or controlling such services for appropriate cutoff or repairs. Any service cutoff or interruption by the Contractor shall be restored at the Contractor's expense.

3.10 HAND EXCAVATION

A. The intent of the item is to either hand excavate in areas where trenching or other excavation is required within the drip line or critical root zone of existing trees and/or sensitive areas. These are areas, where in the opinion of the Certified Arborist, use of a backhoe or tractor would not be appropriate.

3.11 DAMAGE ASSESSMENT

The Contractor shall be assessed restitution for any trees damaged, destroyed, or removed without written permission from Parks, in accordance with the NYC Tree Valuation method and Local Law 3 of 2010. The restitution assessment shall be performed by the NYC Parks Borough Forester.

A. Tree Destruction. Any trees irreparably damaged during the course of construction, as determined by the NYC Parks Borough Forester, will be removed at the Contractor's sole expense. Restitution can be met by the Contractor through the following options:

1. Direct planting by the Contractor or its subcontractor of the required equivalent number of replacement trees at locations determined by Parks or

2. A monetary credit for the value of the tree destroyed; or

3. A combination of (1) and (2) above, If the Contractor plants some replacement trees, a monetary credit will be taken for the difference between the full value of the destroyed tree and the value of the number of replacement trees planted.

B. Tree protection deficiencies. In addition to the remedial actions described above, failure to follow the tree protection guidelines in this Article will result in assessment of liquidated damages. When a tree protection deficiency, as determined by the NYC Parks Borough Forester, is identified, it must be remedied within twenty-four (24) hours of notification by the NYC Parks. Failure to correct the deficiency within this timeframe will result in a liquidated damages assessment set forth in Schedule A for each day, or part thereof, that the tree protection deficiency is not remedied. This amount is in addition to any liquidated damages that may be assessed pursuant to Article 15 of the Standard Construction Contract.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 57 13
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS

A. Contractor Responsibilities

1. Storm Water Pollution Prevention will be performed in accordance with Chapter 19.1 of Title 15 of the Rules of the City of New York.

2. The Contractor shall prevent discharge of sediment or erosion to water courses, public streets or private property from construction activities.

3. The Contractor shall control dust from construction activities in accordance with the latest DEP, DEC, OSHA standards, and all other applicable Federal, State and local regulations.

4. The Contractor shall install erosion control measures to shown on the Contract Drawings and per the manufacturer's recommendations. Contractor shall employ additional methods, means and measures as directed by the Engineer to prevent soils and sediments from discharging off site and/or into existing drainage facilities.

5. DEP may inspect the site at any time to review Erosion and Sediment Control Measures. The Contractor shall install and maintain soil erosion control measures throughout the duration of the Work. Should the DEP deem the measures insufficient, the Contractor shall rectify the deficiency within 24-hrs and be solely responsible for any fines. Labor associated with the correction of deficiencies and/or payment of fines shall be at the Contractor's cost and are not subject to reimbursement by the City.

6. All sections of this specification apply, regardless of the site holding a NYSDEC approved SWPPP, including but not limited to Contractor routine inspections, pre and post-storm inspections, and reporting requirements.

B. Section Includes

1. The Contractor shall provide all labor, materials, tools, equipment, and incidentals including implementation of all erosion and sediment control measures and maintenance of storage areas as directed by the Engineer as required to assure adequate environmental protection.

2. The Contractor shall provide and implement, if applicable, a Stormwater Pollution Prevention Plan (SWPPP) prepared in accordance with the current New York State Department of Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities.

3. The Contractor shall provide an Erosion and Sedimentation Control Plan (E&SCP) that addresses measures to prevent migration of contaminated stormwater, sediment and to prevent erosion of features of the Work. This will be incorporated into the SWPPP, if applicable, or if not applicable, will be a standalone submission.

4. The Contractor shall prevent discharge of sediment or erosion to water courses, public streets or private property from construction activities. The Contractor shall provide methods to prevent construction activities from contaminating stormwater runoff. Methods of constructing berms and dikes to direct stormwater runoff around the Work area to the local drainage system shall be included.

5. The Contractor shall comply with all applicable regulatory requirements and all Federal, State, or local laws, codes, ordinances and regulations which govern the control of sediment, erosion and stormwater during construction activities.

6. The Contractor shall provide Best Management Practices (BMPs) including, but not limited to straw bales, silt fences, silt socks, stabilized construction entrance, catch basin inlet protection, diversion dikes, swales, sedimentation ponds, truck washes/decontamination stations, street sweeping, and/or other means as a temporary structural practice to minimize erosion and sediment runoff.

7. The Contractor shall control dust caused by operation and movement of vehicles and equipment in accordance with the latest DEP, DEC, OSHA standards, and all other applicable Federal, State and local regulations.

8. The Contractor shall contain stockpiled materials within an area specified on the Contract Drawings and prevent stormwater contamination by utilizing a barrier constructed of haybales. Haybales to butt together and be wrapped with plastic liner/tarp around and beneath to contain the stockpile.

9. The Contractor shall maintain the slope and elevation of soil berms, as shown on the Contract Drawings, by preventing erosion through the installation of erosion control fabric until permanent stabilization by seeding is achieved.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 57 23 – Temporary Stormwater Pollution Control

C. Section 01 56 39 –Temporary Tree and Plant Protection

D. Section 01 74 20 – Construction Waste Management

E. Section 02 24 20 – Soil Sampling and Analysis

F. Section 02 41 10 – Demolition and Removals

G. Section 31 23 16 – Excavation

H. Section 33 44 31 – Stormwater Membrane Filtration

1.03 PAYMENT

A. The price bid shall be a unit price per LINEAR FOOT of SILT FENCE as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including fasteners and/or stakes, in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The price bid shall be a unit price per LINEAR FOOT of SILT SOCK as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including composite silt sock and anchorage, in accordance with the plans and specifications, to the satisfaction of the Engineer.

C. The price bid shall be a unit price per SQUARE FOOT of STABILIZED CONSTRUCTION ENTRANCE as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including aggregate and geotextile underlayment, in accordance with the plans and specifications, to the satisfaction of the Engineer.

D. The price bid shall be a unit price per LINEAR FOOT of STRAW BALE DIKE as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including bound straw bales and anchorage, in accordance with the plans and specifications, to the satisfaction of the Engineer.

E. The price bid shall be a unit price per SQUARE YARD of EROSION CONTROL FABRIC as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including erosion control fabric and staples, in accordance with the plans and specifications, to the satisfaction of the Engineer.

F. The price bid shall be a unit price per LINEAR FOOT of BIOSWALE PROTECTION FENCE as shown in the Contract Drawings and shall include the cost of all labor, materials and equipment necessary to complete the work, including fasteners and/or stakes, in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

1. Comply with applicable provisions and recommendations of the following except as otherwise shown or specified. Most recent version of the NYC Stormwater manual.

2. Most recent version of the NYSDEC, New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), (2022 or later)

3. Most recent version of the New York State Stormwater Management Design Manual, (2024 or later)

4. Urban/Stormwater Runoff Management Practices, NYSDEC, (latest guidance)

1.05 REGULATORY COMPLIANCE

A. Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.

1. Most recent version of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities, (2025 or later)

2. Most recent version of the NYSDEC SPDES General Permit for Stormwater Discharges from Municipal Separate Storm Sewer System (MS4), (2025 or later)

3. 2022 or latest version of NYCDEP Stormwater Design Manual

All stormwater management practices shall comply with the requirements of the Unified Stormwater Rule (USR), as implemented through the 2022 NYCDEP Stormwater Design Manual.

1.06 SUBMITTALS

A. Working Drawings: The Contractor shall submit Working Drawings in accordance with the requirements of Section 01 33 00 – Submittal Procedures. Working Drawings and other documentation required shall conform with the requirements specified and shown on the Contract Drawings.

1. Working Drawings must show details of the Sediment and Stormwater Control System. The Working Drawings must include, at a minimum, the following:

a. Plan locations of all components of the Sediment/Stormwater Control System.

b. Details of all applicable BMPs (e.g., silt sock, diversion dike, straw bale berm, decontamination stations, etc.).

2. The Contractor shall submit manufacturer's descriptive literature and installation instructions for stockpile liner and cover material.

3. The Contractor shall submit catalogue cut sheets for the erosion control blanket and staples to be used.

B. Erosion and Sediment Control Plan (E&SCP): The Contractor shall develop and submit to the Engineer for approval, prior to commencement of construction activities, an E&SCP. The E&SCP must address schedules and measures that will be taken to prevent migration of contaminated stormwater/sediment, and to prevent erosion of features of the Work. The E&SCP shall include the following at a minimum:

1. Stormwater runoff.

2. Provisions for measures to prevent contaminant and sediment migration.

3. Diversion of stormwater: The Contractor shall include provisions for controlling stormwater runoff in and around excavation areas.

4. Soil Storage Area: All details of temporary soil storage to be implemented as specified in this section.

5. Soil Stabilization practices: All details of soil stabilization practices to be implemented, as specified in this section.

6. Provisions for all other applicable Best Management Practices.

7. Erosion and Sediment Control Plan (E&SCP) must meet the requirements of the Unified Stormwater rule and reference the latest NYCDEP Stormwater Design Manual.

C. The Contractor shall develop and submit to the Engineer for approval a SWPPP prepared by a Qualified Professional in accordance with the current applicable New York City and New York State requirements. The SWPPP will be developed and submitted to the Engineer for approval prior to the initiation of construction activities. The SWPPP will include the following at aminimum:

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 surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of off-Site material, waste, borrow or equipment storage areas; and location (s) of the stormwater 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 stormwater 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 stormwater, 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 stormwater runoff characteristics at the Site.
17. Stormwater Pollution Prevention plans must meet the requirements of the Unified Stormwater rule and reference the latest NYCDEP Stormwater Design Manual.

D. Inspection Reports: Contractor shall submit inspection reports consistent with requirements of the SWPPP, the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities, and the current NYSDEC SPDES General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems.

1. Site inspections must be conducted by the Qualified Inspector.
2. Site inspections must typically be conducted at a minimum of once every seven (7) calendar days and twice every seven (7) calendar days for Sites with greater than five (5) acres of land disturbance.
3. Inspection reports must be maintained in a logbook at the Site with SWPPP.

1.07 QUALITY CONTROL (NOT USED)

1.08 DEFINITIONS / EXPLANATION OF TERMS

A. Best Management Practices: Physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of water, and have been approved by the New York City Department of Environmental Protection or other accepted certified agency.

B. Commencement of Construction: The initial removal and disturbance of soils and vegetation associated with clearing, grading, excavation, fabrication, or installation activities.

C. Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as geological creep, detachment, movement of soil or rock fragments by water, wind, ice, or gravity.

D. Erosion/Sediment Control: Any temporary or permanent measures taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water does not leave the Site.

E. Final Stabilization: All soil-disturbing activities at the Site have been completed and uniform, perennial vegetative cover with the density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geo-textiles) have been employed on all unpaved areas and areas not covered by permanent structures.

F. Receiving Waters: Bodies of water or surface water systems receiving water from upstream manmade (or natural) streams

G. Sediment: Fragmented material that originates from weathering and erosion of rocks and unsolicited deposits, and is transported by, suspended in, or deposited in water.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. 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.

Where erosion and sediment control practices are not designed in conformance with these technical standards, the Contractor must demonstrate equivalence to the technical standard.

2.02 MANUFACTURERS

A. Contractor shall submit temporary seed suppliers for review and approval.

2.03 MATERIALS

A. Silt Fencing

1. Silt fence shall be prefabricated wire backed fabric with posts such as Carthage Silt Fences, manufactured by Carthage Mills, Cincinnati OH, L & M Supply Company, Willacoochee, GA, Varsity Inc., Pittsburgh, PA or approved equal.

2. Posts shall be wood, steel, or an approved synthetic material, with a minimum length of three (3’) feet. Hardwood posts shall have a minimum cross-sectional area of 1.25” x 1.25” and steel posts of U, T, L, or C shape shall weigh one (1 lb.) pound per linear foot.

3. Wire mesh fencing shall be a minimum of fourteen (14) gauge with a maximum six (6") inch mesh opening

4. Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain, synthetic polymers, composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The geotextile and the threads used in sewing geotextiles, shall be resistant to chemical attack, rot, and mildew. The geotextile shall have no tears or defects which adversely alter its physical properties. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages. The geotextile shall have no tears or defects which adversely alter its physical properties. Geotextile for temporary silt fence shall meet or exceed requirements for temporary silt fence as set forth by AASHTO M-288 and as outlined below:

Property	**Unit**	**Test**	**Value**
Grab Strength	LB	ASTM D4632	90
Grab Elongation	%	ASTM D4632	20 (max)
Trapezoid Tear Strength	LB	ASTM D4533	60
Permittivity	1/sec	ASTM D4491	0.05
Flow Rate	gpm/sf	ASTM D4491	10
Apparent Opening	US Std Sieve	ASTM D4751	30
UV Stability	%	ASTM D4355	70

B. Bioswale Protection Fencing

1. Protective fence shall be prefabricated wire backed fabric with posts such as Carthage Silt Fences, manufactured by Carthage Mills, Cincinnati OH, L & M Supply Company, Willacoochee, GA, Varsity Inc., Pittsburgh, PA or approved equal.
2. Posts shall be wood, steel, or an approved synthetic material, with a minimum length of three (5') feet. Hardwood posts shall have a minimum cross-sectional area of 1.25" x 1.25" and steel posts of U, T, L, or C shape shall weigh one (1 lb.) pound per linear foot.
3. Wire mesh fencing shall be a minimum of fourteen (14) gauge with a maximum six (6") inch mesh opening

4. Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain, synthetic polymers, composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The geotextile and the threads used in sewing geotextiles, shall be resistant to chemical attack, rot, and mildew. The geotextile shall have no tears or defects which adversely alter its physical properties. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages. The geotextile shall have no tears or defects which adversely alter its physical properties. Geotextile for temporary silt fence shall meet or exceed requirements for temporary silt fence as set forth by AASHTO M- 288 and as outlined below:

Property	**Unit**	**Test**	**Value**
Grab Strength	LB	ASTM D4632	90
Grab Elongation	%	ASTM D4632	20 (max)
Trapezoid Tear Strength	LB	ASTM D4533	60
Permittivity	1/sec	ASTM D4491	0.05
Flow Rate	gpm/sf	ASTM D4491	10
Apparent Opening	US Std Sieve	ASTM D4751	30
UV Stability	%	ASTM D4355	70

C. Inlet Protection

1. Inlet protection inserts for catch basins, yard inlets and other water collection infrastructure shall comply with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 01 57 23 – Temporary Stormwater Pollution Control.

D. Stabilized Construction Entrance

1. Stone shall consist of straight one (1”) inch or two (2”) inch coarse aggregate in accordance with ASTM C33, free from organic or other deleterious material. Recycled Concrete Aggregate (R.C.A.) of the specified sizes is acceptable.

2. Geotextile - Separation/Stabilization shall comply with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 33 44 31 – Stormwater Membrane Filtration.

3. For locations specifying modular construction entrance mats:
   a. Entrance mat shall be comprised of a compression – molded HDPE top surface of 2-7/8" tall unidirectional, tapered, and staggered pyramids in the direction of travel, to dislodge and collect mud.
   b. Each mat shall be 12 feet long, 7 feet wide and 3-3/4" thick (not counting pyramid height)
   c. Mats shall have a crush rating of 20,000 lbs or more per pyramid.
   d. Mats shall be UV stable and chemical resistant.
   e. Mats shall be adhered to concrete or asphalt using concrete sleeve anchors and to disturbed soil using 18 or 24" form-stakes.

E. Straw Bale Dike

1. Straw Bales: New straw that shall be either wire bound or nylon string tied. Straw bales shall be two stringers, approximately 18" wide x 14" high x 36" long.

2. Anchors: Steel pickets, 2" x 2" wood stakes or rebars approximately 2 ½ to 3 feet long. Drive stakes flush with bales.

F. Silt Sock

1. Silt Sock shall be 12" diameter minimum prefabricated, tubular knit multi-filament polypropylene inert to most soil chemicals including alkaline, weak acids, and salt.

2. The silt socks shall have no tears or defects which adversely alter its physical properties prior to installation.

3. Silt sock shall meet or exceed requirements set forth by NYS DEC and as outlined below:

Property	**Unit**	**Test**	**Value**
Melting Point	°C		166
Tensile Strength	psi	ASTM 6241 & ASTM 5053	202
UV Protection	Photodegradable / UV Stabilized		
UV Resistance	%	ASTM G-155	100 @ 1000 hr.
Mesh Opening	inch		1/8
Minimum Functional Longevity	years		2

4. Silt sock fill shall be compost infill that shall be well decomposed (matured at least 3 months), weed-free, organic matter. It shall be aerobically composted, possess no objectionable odors, and contain less than 1%, by dry weight, of manmade foreign matter. The physical parameters of the compost shall meet the standards listed in the table below.

Compost Standards Table Note: All biosolids compost produced in New York State (or approved for importation) must meet NYS DEC's 6 NYCRR Part 360 (Solid Waste Management Facilities) requirements. The Part 360 requirements are equal to or more stringent than 40 CFR Part 503 which ensure safe standards for pathogen reduction and heavy metals content. When using compost filter socks adjacent to surface water, the compost should have a low nutrient value.

Property	Measurement
Organic Matter Content	25%-100% (dry weight)
Organic Portion	Fibrous and elongated
pH	6.0-8.0
Moisture Content	30%-60%
Particle Size	100% passing a 1" screen and 10-50% passing a 3/8" screen
Soluble Salt Concentration	5.0dS/m (mmhos/cm) max

G. Haybales

1. Haybales with Plastic Liner/Tarp 1. Haybales: All haybales shall be of straw, and shall be standard sized bales. Bales shall be placed in a single row surrounding completely the stockpile area, with ends of adjacent bales tightly abutting one another.

H. Concrete Truck Washout

1. Washout facilities shall be provided for every project where concrete will be poured or otherwise formed on the site. The washout facility shall be designed per the most recent version of the NYSDEC, New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), (2022 or later).

2. If space constraints do not allow for the installation of the standard concrete washout facility as described in the NYSDEC, New York State Standards and Specifications for Erosion and Sediment Control (Blue Book), 2-24, a watertight, portable 4'L x 8'W x 2'D concrete washout box from Concrete Washout Systems shall be used, provided it provides the minimum volumes as described above, or approved equal. The Contract shall furnish, maintain, and remove containers to the site as required for the concrete deliveries at no additional cost.

3. Concrete truck washout practices shall be installed prior to pouring any concrete.

4. Washout facilities for each site must be done in an approved "concrete containment area" which shall be located a minimum of 100 feet from any drainage swale, storm drain inlets, wetlands, streams, and other surface waters. Concrete wash water shall not be discharged to the sewers, surface

water bodies, or on to the ground. All washout water must be removed from the site(s) daily.

5. All concrete washout facilities shall be inspected daily. Damaged or leaking facilities shall be deactivated and repaired or replaced immediately. Excess rainwater that has accumulated over hardened concrete should be pumped to a stabilized area, such as a grass filter strip.

6. Accumulated hardened material shall be removed when 75% of the storage capacity of the structure is filled. Any excess wash water shall be pumped into a containment vessel and properly disposed of off site.

7. Dispose of the hardened material off-site in a construction/demolition landfill.

8. The plastic liner (if applicable) shall be replaced with each cleaning of the washout facility.

9. Inspect the project site frequently to ensure that no concrete discharges are taking place in non-designated areas.

I. Erosion Control Fabric

1. The Erosion Control Fabric shall be a machine-produced, 100% biodegradable blanket composed of a blend of 70% agricultural straw and 30% coconut fiber.

2. The blanket shall be designed for slopes ranging from 1:1 to 1:2, with a functional longevity of up to eighteen (18) months.

3. It shall have a consistent thickness with the straw and coconut fiber uniformly distributed, and be covered on both top and bottom sides with 100% biodegradable woven natural organic fiber netting.

4. The top netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands to form an approximate 0.5” x 1.0” mesh.

5. Acceptable products include, but are not limited to:

   - SC150BN as manufactured by North American Green, Evansville, IN
   - Landlok® CS2 as manufactured by SI® Geosolutions, Chattanooga, TN
   - Type EC/SC2 as manufactured by Pinelands Nursery, Columbus, NJ;
   - or approved equal.

6. Staples shall be steel staples provided by the Erosion Control Blanket Manufacturer.

7. The staple pattern shall be as recommended by the Manufacturer.

PART 3 EXECUTION

3.01 METHOD OF CONSTRUCTION

A. The Contractor shall provide methods to prevent construction activities from contaminating off-Site stormwater runoff. Methods of constructing berms, dikes, and/or swales to direct stormwater runoff around the Work area to the local drainage system must be included.

B. The Contractor and subcontractors must sign a copy of the certification statements below before undertaking any construction activity at the Site identified in the Stormwater Pollution Prevention Plan (SWPPP) and/or Erosion and Sedimentation Control Plan (E&SCP). All certifications must be included in the SWPPP AND E&SCP.

C. The Contractor must have a Qualified Inspector conduct an assessment of the erosion control measures prior commencement of land disturbance activities and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP and E&SCP have been adequately installed or implemented to ensure overall preparedness of the Site for the commencement of construction. Following commencement of construction, Site inspections must be conducted within twenty-four (24) hours following any rainfall of 0.5 inches or more, but in no case less than once every seven (7) calendar days, except all basins and all drainage swales must be inspected daily.

D. The SWPPP and E&SCP must be kept current on file at the construction Site for review by a NYSDEC and NYCDEP inspector. If there is a significant change in construction that may have a significant effect on the potential for the discharge of pollutants from the Site and that has not otherwise been addressed in the SWPPP AND E&SCP, the Contractor shall update the SWPPP AND E&SCP to reflect those required changes. The SWPPP AND E&SCP would also require an amendment if the SWPPP AND E&SCP proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the SWPPP AND E&SCP or achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity. Additionally, the SWPPP AND E&SCP must be amended to identify any new subcontractor(s). These amendments must be submitted to the Engineer and DEP.

E. Repair or replacement of Erosion and Sediment Control BMPs damaged by storm events must begin by the day after the end of the storm event and be completed as soon as possible but no more than three (3) days after the storm event during which the damage resulted.

F. EROSION CONTROL FABRIC

1. Prior to installation, the Contractor shall grade the receiving areas and remove any large, sharp stones.

2. The blanket shall be delivered rolled and unrolled with the appropriate side against the soil surface.

3. All blankets must be securely fastened to the soil surface by installing staples in locations as recommended by the Manufacturer.

4. The edges of parallel blankets must be stapled with a four (4") inch overlap.

5. Where consecutive blankets are spliced across the slope, they shall be installed in a shingle style with a three (3") inch overlap.

6. Repair or replacement of Erosion and Sediment Control BMPs damaged by construction activities or by wearing must begin by the day after the damage is discovered and be completed as soon as possible but no more than three (3) days of the inspection during which the damage was discovered.

7. All erosion and sediment control devices shall remain, be inspected and maintained throughout the construction activities and be removed after completion of construction and surface stabilization.

3.02 QUALITY ASSURANCE

A. Permits and Regulations:

1. The Contractor shall obtain all necessary permits and be responsible for implementing the terms and requirements of these permits as needed and for payment of all fees.

2. The Contractor shall handle all material in compliance with applicable requirements of OSHA and other governing authorities having jurisdiction.

3. Certifications. The Contractor and subcontractors must sign a copy of the certification statements below before undertaking any construction activity at the Site identified in the SWPPP. All certifications must be included in the SWPPP.

a. The Contractor shall understand and agree to comply with the terms and conditions of the SWPPP for the construction Site identified in such SWPPP as a condition of authorization to discharge stormwater.

B. Inspections. The Contractor must have a Qualified Inspector 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 at least once every seven (7) calendar days and twice a week for a site with soil disturbance greater than five (5) acres. The inspection reports must be kept on file at the

construction Site for review by a DEC/DEP inspector.

C. Stabilization. The Contractor shall initiate stabilization measures as soon as practicable in portions of the Site where construction activities have temporarily or permanently ceased.

D. The SWPPP must be kept current on file at the construction Site for review by a DEC/DEP inspector. 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, it 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 stormwater discharges from permitted construction activity. Additionally, the SWPPP will be amended to identify any new subcontractor.

3.03 ENVIRONMENTAL REQUIREMENTS

A. Soil Stabilization: The stabilization practices to be implemented must include one or a combination of the following: mulching, protection of trees and shrubs, preservation of mature vegetation. Protection of trees must be in accordance with Section 01 56 39 – Temporary Tree and Plant Protections and Section 31 23 26 - Excavation. Stabilization practices shall be as approved by the Engineer. The Contractor shall record the dates when the major grading activities occur (i.e. clearing and grubbing, excavation, embankment and grading); when construction activities temporarily or permanently cease on a portion of the Site; and when stabilization practices are initiated. Except as provided in paragraphs below, stabilization practices shall be initiated as soon as practicable, but no more than fourteen (14) days after construction activities have temporarily or permanently ceased.

B. Unsuitable Conditions: Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather. Stabilization practices must be initiated as soon as practicable after conditions become suitable.

C. Temporary Inactivity Less than fourteen (14) Days: Where construction activity will resume on a portion of the Site within fourteen (14) days after it temporarily ceases, no stabilization practices will be required.

D. Erosion and Sediment Control: Erosion and Sediment control BMPs must be operational at all times during the Work, specifically during excavation, backfilling and restoration, and decontamination operations. The sediment and erosion control system must be capable of handling stormwater during construction. Damage to excavation slopes and the migration of contaminated soil to downstream areas resulting from storm events shall be repaired or remediated by the Contractor, at the Contractor’s expense.

E. Stormwater: At no time will the Contractor allow stormwater from soil stockpiling operations, or water from decontamination operations to migrate off of, or percolate into, the ground below the temporary stockpile area or decontamination area, so as to impact non-contaminated areas. The Engineer will monitor any overflow or leakage that occurs, and may at his discretion require the Contractor to perform soil sampling within non-contaminated areas affected by such overflow. Any soils that have been contaminated by such overflow shall be removed, treated and disposed of by the Contractor. All sampling, analyses, treatment and disposal of soils required as a result of overflow on formerly non-contaminated soil shall be performed by the Contractor at no additional cost to DEP.

3.04 PROJECT CONDITIONS

A. Existing Work: All BMPS and other sediment/stormwater controls shall be installed such that other aspects of the Work are not adversely impacted or endangered. All installations are subject to the approval of the Engineer.

B. Dust Control: The Contractor shall be responsible for controlling visible dust caused by Work operations and the moving of vehicles and equipment. Dust control must be implemented when soils are exposed, before, during and after Work activity ceases. Dust control will also be required on the weekends. The Contractor shall apply the application of water, covering exposed soils, dust screens attached to fencing or other methods, subject to the Engineer's approval, when visible dust is present on-Site, in accordance with the Health and Safety Plan. The use of chemicals for dust control, including calcium chloride, will not be permitted.

1. All excavation, loading and transport of materials shall minimize the formation of dust and will conform to Section 31 23 16 – Excavation. To prevent dust generation, application of water to roadways and active Work areas shall be utilized as required. The Contractor's operations shall include air monitoring and dust minimization measures, consistent with the Detailed Health and Safety Plan (HASP) Specifications.

C. Silt and Sediment Disposal: All silt and sediment which accumulates behind any BMPs used on the Site must be removed and disposed of off-Site in accordance with all applicable Federal, State and local regulations.

3.05 STORAGE, HANDLING AND REMOVAL

A. The Contractor shall store, handle, and remove material and equipment consistent with requirements of the SWPPP and NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-15-002) or latest version.

B. Removal of all waste will be in accordance with DEP Standard Specifications for On-Site Green Infrastructure Section 01 74 20 – Construction Waste Management and Disposal.

3.06 INSTALLATION

A. All installation of erosion and sediment control BMPs must be consistent with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control and the New York State Stormwater Management Design Manual. Where erosion and sediment control practices are not designed in conformance with these technical standards, the Contractor must demonstrate equivalence to the technical standard.

B. Straw Bale Dike: All sediment and erosion control practices are to be installed prior to any major soil disturbances. At all new drain inlets, catch basins, or manholes, and in rows, where shown, excavate the area to accommodate placement of straw bales which are to be embedded in the soil a minimum of four (4") inches, and placed so the string or wire is horizontal. Place bales in a row with ends tightly abutting the adjacent bale. Anchor the bales securely by driving two (2) stakes or rebars through each bale to a minimum depth of eighteen (18”) to twenty-four (24”) inches into the ground. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes shall be driven flush with the top of the bale. Maintain straw bale filters as directed by the Engineer until a permanent vegetative cover has been established and pavements and other improvements are completed. Inspect straw bales frequently and after each rainfall event, repair or replace promptly as needed. Remove accumulations of sediment trapped by straw bale filters regularly. At the conclusion of construction, the temporary straw bales shall be removed from the site and legally disposed of. The areas where the straw bales were installed shall be restored to match the surrounding area, this may include, but not limited to, seeding and establishing the lawn area.

C. Silt Fence shall be installed prior to land disturbing activities or as necessary to control erosion from land disturbing activities. Comply with all applicable standards for Soil Erosion and Sediment Control as set forth by New York State DEC. Care shall be taken when installing the silt fence that all the requirements of Article 14, Section C, “Tree Work” shall be followed. In addition, where tree roots of one (1”) inch or greater are encountered, or if directed by the Engineer, the Contractor shall move the location of the silt fence to avoid damage to existing trees.

Contractor shall first excavate a trench approximately six (6”) inches deep and four (4”) inches wide in the line of the silt fence. Silt fence to be located at least ten feet from the toe of steep slopes and nearly level throughout its length. Contractor shall drive posts securely at least sixteen (16”) inches into the ground on the down slope side of the trench. Post spacing shall be a maximum of ten (10’) feet on center. Adjust spacing to place posts at low points along fence line.

Fasten support wire fence to upslope side of posts, extending six inches into the trench. Attach continuous length of fabric to upslope side of fence posts with ties space every twenty-four (24”) inches at top and mid-section. Avoid joints, particularly at low points

in the fence line. Where joints are necessary, fasten fabric securely to support posts and overlap to the next post. Place the fabric in the trench so the bottom folds across the bottom of the trench. Place backfill in the trench over the fabric to the ground line and compact with a power tamper.

D. Stabilized Construction Entrance: Unless otherwise shown on the plans, for sites with only one (1) construction entrance, the Stabilized Construction Entrance shall be twenty-four (24') feet wide. Where there are two (2) or more construction entrances to the site the Stabilized Construction Entrance shall be twelve (12') feet wide minimum, but not less than the full width of the entrance. Length of the entrance shall be a minimum of fifty (50') feet.

Geotextile – Separation/Stabilization: The ground shall be prepared by removing stumps and other organic material, along with any large boulders and sharp objects which may tear or damage the fabric. After the ground has been prepared, the fabric shall be rolled directly on the ground. The fabric shall be placed over the entire area that is to be covered by the aggregate, unless otherwise directed by the Engineer. All seams shall be overlapped approximately six (6") inches. No equipment, materials or machinery shall be placed on or be transported over exposed fabric. Broken stone shall then be carefully placed to prevent dislocation of the fabric.

If the fabric is damaged during installation, the rupture shall be removed and the damaged area shall be covered with a patch of new fabric that 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.

Broken stone shall be spread utilizing suitable equipment or from piles dumped along the proposed site. Stone shall be evenly spread so that the course will have, after rolling, a minimum of six (6") inches in thickness. No segregation of large or fine materials will be allowed, but the stone as spread shall be well graded with no pockets of fine material.

E. Silt Sock: Silt Sock shall be installed prior to land disturbing activities or as necessary to control erosion from land disturbing activities. Comply with all applicable standards for Soil Erosion and Sediment Control as set forth by New York State DEC.

"Tree Work" shall be followed. In addition, where tree roots of one (1") inch or greater are encountered, or if directed by the Engineer, the Contractor shall move the location of the silt fence to avoid damage to existing trees.

Compost filter socks shall be anchored in earth with 2" x 2" wooden stakes driven 12" into the soil on 10-foot centers on the centerline of the sock. On uneven terrain, effective ground contact can be enhanced by the placement of a fillet of filter media on the disturbed area side of the compost sock. If silt socks are placed on a paved surface, sandbags shall be placed on 10-foot centers on the center of the silt sock and good contact with the paved

surface shall be verified.

F. Maintenance: The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition consistent with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control and the New York State Stormwater Management Design Manual.

3.07 FIELD QUALITY CONTROL

A. Inspections: Site Inspections must be conducted consistent with the requirements of the SWPPP and the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities. The Qualified Inspector 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 daily.

3.08 CLEANING

A. The Contractor shall clean the Site and equipment consistent with requirements of the SWPPP and the current NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities. Where appropriate, truck washes/decontamination stations should be installed to minimize the migration of sediment off-Site as specified in the DEP Standard Specifications for Green Infrastructure.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 57 16
TEMPORARY PEST CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes the requirements for rodent and waterbug pest control.

B. Rodent and waterbug pest control will be done in accordance with New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 7.88 - Rodent and Waterbug Pest Control.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Department of Transportation (NYCDOT) Standard Highway Specifications

1.05 REGULATORY COMPLIANCE

A. NYC Local Law 37 of 2005

1.06 SUBMITTALS

A. The Contractor shall submit working drawings in accordance with the requirements of Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions for materials specified in NYCDOT Standard Highway Specifications Section 7.88.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 57 23
TEMPORARY STORMWATER POLLUTION CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS

This section describes the requirements for inlet protection for erosion control in the form of a silt sack to be installed at catch basins, yard inlets and other water collection infrastructure at locations noted on the Contract Drawings and as directed by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 57 13 - Temporary Erosion and Sediment Control

1.03 PAYMENT

A. The price bid for INLET PROTECTION shall be unit price for EACH inlet protection and shall include the cost of all labor, materials, equipment (including maintenance or replacement when the silt sack is damaged), and any incidental expenses necessary to complete the Work in accordance with the Specifications to the satisfaction of the Engineer. The cost of maintaining and clearing the inlet protection during and upon completion of the Work will be deemed included in the price bid for this item.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

B. ASTM D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles

C. ASTM D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

D. ASTM D3786 Standard Test Method for Busting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method

E. ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

F. ASTM D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile

G. ASTM D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

H. ASTM D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

I. ASTM D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. All submittals shall be submitted prior to purchase and in accordance with the requirements of Section 01 33 00 – Submittal Procedures.

B. Manufacturer's Data: The Contractor shall submit manufacturer's data with all properties to demonstrate compliance with the requirements of this specification.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 INLET PROTECTION

A. The inlet protection shall be an open-top, geotextile bag that can be suspended from a catch basin grate. The suspended solids are allowed to settle out of the slowed flow and are captured by the bag prior to entering the inlet. There shall be two dump straps attached at the bottom of the bag to facilitate the emptying and cleaning of bag and there shall be two lifting hoops as an integral part of the system to be used to lift the bag from the catch basin.

B. The geotextile bag shall be constructed with high-tenacity, monofilament, polypropylene yarns, which are woven into a stable network such that the yarns retain their relative position. The geotextile shall be resistant to ultraviolet degradation and to biological and chemical environments normally found in soils. The inlet protection shall be the "Dandy SackTM" as manufactured by Mirafi Construction Products, Burlington, CT, or the "SiltSack®" as manufactured by The BMP Store, Richmond, VA, or "StormSok" as manufactured by Fabco Industries, Jericho, NY, or approved equal.

C. Geotextile used for the inlet protection shall meet the following minimum properties:

Property	**ASTM Test Methods**	**Units**	**Results (Min.)****	
			MD*	CD#
Grab Tensile Strength	D4632	lbs. (kN)	255 (1.13)	200 (0.89)
Grab Tensile Elongation	D4632	%	15	10
Trapezoid Tear Strength	D4533	lbs. (kN)	40 (0.175)	50 (0.22)
CBR Puncture	D6241	lbs. (kN)	1000 (4.448)	
UV Resistance (at 500 hours)	D4355	%	90	
Apparent Size Opening	D4751	U.S. sieve (mm)	40 (0.425)	
Flow Rate	D4491	$gal/min/ft^2$ $(l/min/m^2)$	40 (1629)	
Permittivity	D4491	sec^{-1}	0.55	
Mass/ Unit Area	D5261	oz/yd^2 (g/m^2)	5.6 (190)	
Thickness	D5199	Mils (mm)	24 (0.6)	

* MD = Machine Direction, the direction in the plane of the fabric parallel to the direction of manufacture.

CD= Cross Machine Direction, the direction in the plane of the fabric perpendicular to the direction of manufacture.

** All properties are Minimum Average Roll Values (MARV).

PART 3 EXECUTION

3.01 INSTALLATION

Inlet protection shall be installed prior to start of construction activity on site and shall not be removed until final acceptance of Work, unless otherwise directed by the Engineer. The Contractor shall remove the grate of the catch basin and install the inlet protection in accordance with the Manufacturer's written instructions. The grate shall be set back into place after the inlet protection is installed with the lifting straps outside or on top of the grate.

3.02 MAINTENANCE

The Contractor shall remove all accumulated sediment and debris from the vicinity of the catch basin after each storm event and as directed by the Resident Engineer for the period of this Contract. Where the inlet protection is more than one-third full of sediment, the bag shall be cleaned by lifting the unit out of the catch basin and emptying the contents to an area within the Contract limit line as directed by the Engineer.

3.03 REPLACEMENT

The inlet protection shall be maintained in working condition until Final Acceptance. If the bag breaks, is damaged, or ceases to function, the Contractor shall remove and replace it at no additional cost to the City.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Item, the Contractor shall furnish, erect, and maintain a CONSTRUCTION SIGN (i.e., a project information panel) in accordance with the plans and Specifications. Under Local Law 47/13, all miscellaneous construction signs – including City, Contractor and 311 contact information are consolidated in one simplified project information panel. No other signage or permits, unless otherwise required by law, may be posted.

B. The Contractor shall procure and erect a project information panel at the project site identifying the project. The panel shall be erected within twenty-one (21) days from the date the Contractor is ordered to Commence Work and shall be in accordance with the Specifications and details included in this Section.

C. Attachments: The following figures are attached to this Section:

1. Figure 1 – Project Information Panel Layout (For Projects with Street Frontage of 60 Feet or Greater)

2. Figure 2 – Project Information Panel Layout (For Projects with Street Frontage of Less than 60 Feet)

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

1.03 PAYMENT

A. The price bid shall be a unit price for EACH Construction Sign furnished, erected and removed at the end of the project and shall include the cost of all labor, materials and equipment necessary to complete the Work, including hardware for mounting on fence or frame and continuous maintenance, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Local Law 47/13
B. Rules of the City of New York 3301-01 (RCNY 3301-01)

1.05 REGULATORY COMPLIANCE (NOT USED)

CONTRACT GI-CONS-7
SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

1.06 SUBMITTALS

A. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

B. Submit the following for approval prior to fabrication of the project information panel:

1. Detailed sketch showing all lettering, dimensions and colors.

2. Detailed bill of materials indicating materials of construction for all project sign components.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MATERIALS

A. Project Information Panel

1. The project information panel shall be constructed in accordance with RCNY 3301-1, including the following requirements shown on Figure 1 or Figure 2 attached to this Section. The Engineer will provide project specific information.

a. For construction sites with a street frontage of 60 feet or greater, the sign dimensions shall be in accordance with Figure 1. For construction sites with a street frontage less than 60 feet, the sign dimensions shall be in accordance with Figure 2.

b. For projects that are not funded through the New York State Revolving Fund, the information and lettering shown below the sample rendering in Figures 1 and 2 should be removed and the rendering extended to fill that space.

2. Project information panels shall include the following information:

a. A rendering, elevation drawing, site plan, or zoning diagram of the building exterior that does not contain logos or commercially recognizable symbols;

b. A title line stating "Work in Progress:" and specifying the nature of the project;

c. Anticipated project completion date as season YYYY;

d. Website address to contact for project information;

e. The corporate name and telephone number of the Contractor;

f. The following statement, in both English and Spanish, "TO ANONYMOUSLY REPORT UNSAFE CONDITIONS AT THIS WORK SITE, CALL 311";

g. When applicable, a copy of the primary project permits, with accompanying text "To see other permits issued on this property, visit: www.nyc.gov/buildings." The permit shall be laminated or encased in a plastic covering to protect it from the elements or shall be printed directly onto the project information panel.

h. The name(s) of government official(s) shall be incorporated into the panel in accordance with Figures 1 and 2. For projects outside the City, the lines for "Borough President" and "City Council Member" shall be removed.

3. The project information panel shall be constructed of ¾-inch thick plywood panel of the following quality or equal as approved by the Engineer:

   a. High density overlaid exterior type fir plywood panels, 5 ply, B-B grade or better.

   b. Each plywood panel shall be resin impregnated on both sides.

4. The content shall be written in the Calibri font or similar Sans Serif font style, with letters a minimum of 1 inch (25 mm) high, as measured by the upper case character. Such letters shall be white, on a blue background, with such blue color of a shade matching Pantone 296, or RGB 15, 43, 84, or CMYK 100, 88, 38, 35.

2.02 MANUFACTURER

A. The Construction Sign shall be as manufactured by Sign Design Group of NY, Inc., LIC, N.Y, Manhattan Signs and Designs, New York, N.Y., Mineola Signs, Mineola, N.Y., or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION & LOCATION

A. The Construction Sign shall be installed either on the fence at the Park entrance, or a wood frame as indicated on the Contract Drawings. The Construction Sign shall be installed in a true vertical position and mounted to fence with four (4) one-half (1/2") inch diameter x six (6") inch long galvanized lag bolt, bolted to additional two (2) 2 x 4 lumber slats in the back of the fence as shown on the standard detail.

B. For projects where NYC Department of Buildings (NYC DOB) approval is required, sign shall be installed per NYC Building Code Section 3301.9 and Local Law 47 of 2013. The DOB permit (where required) shall be laminated or encased in a plastic covering to protect it from the elements or shall be printed directly onto the project information panel and posted where shown.

CONTRACT GI-CONS-7
SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

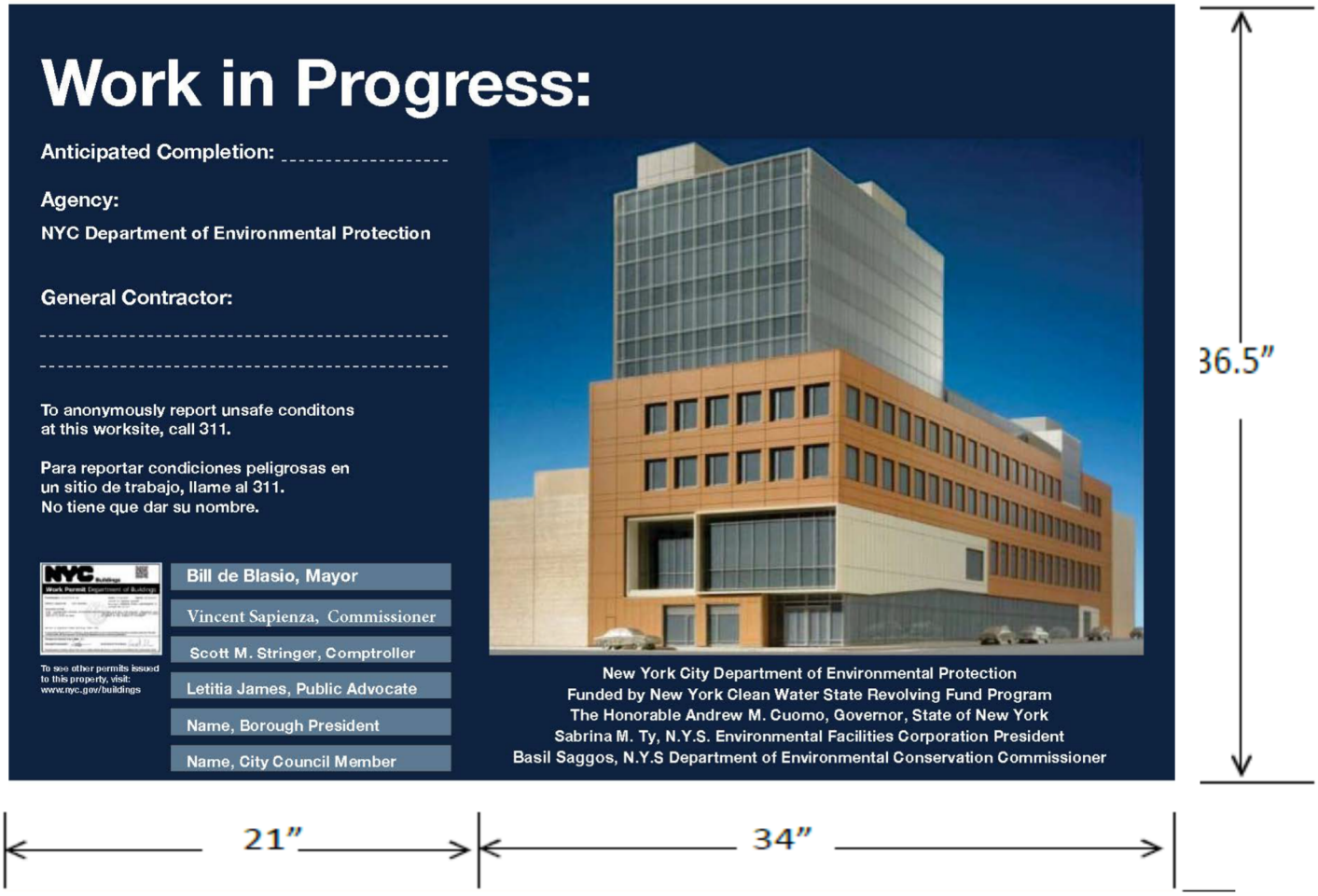
Figure 1.



Note: As directed by the Engineer, the wording below the rendering shall be deleted if the project is not funded under the NYS Revolving Loan Fund and the rendering shall be extended to fill in that space.

CONTRACT GI-CONS-7
SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

Figure 2.



Note: As directed by the Engineer, the wording below the rendering shall be deleted if the project is not funded under the NYS Revolving Loan Fund and the rendering shall be extended to fill in that space.

C. Installation Types:

1. For Construction Sign on Fence: Installation shall be as per NYC Department of Parks and Recreation (NYC DPR) standard detail, except where NYC DOB approval is required.

   a. On Steel Fence, mounted over upper horizontal steel bar.

   b. On Chain Link Fence, mounted over horizontal brace or continuous mid-rail.

   c. On Construction Fence, mounted between vertical posts, with extra post at no more than 4'-0" o.c. (see Section 01 56 00 Temporary Barriers and Enclosures).

2. For Construction Sign on Frame: Installation shall be as per NYC DPR standard detail.

3.02 MAINTENANCE

A. The Contractor shall maintain the CONSTRUCTION SIGN in accordance with plans and Specifications.

B. The Contractor shall maintain the CONSTRUCTION SIGN during the life of the Contract, in a condition satisfactory to the Engineer.

C. Maintenance of the CONSTRUCTION SIGN includes, but is not limited to, restoration of any portion of the sign that has been defaced by graffiti, or any necessary changes to text as required by the Engineer. Modifications to the text and names printed on the sign may occur throughout the life of the Contract. Modifications such as name revisions, dignitary title changes, completion dates, and text revisions may be required to maintain the sign in accordance with current information. All modification to the text on the construction sign shall match the font and format of the original text. The Contractor shall attach the modified text to the construction sign in a manner that will not peel off. The Contractor shall install custom information on the sign within forty-eight (48) hours of direction by the Engineer. Permit (where required) and protective laminate shall be maintained in good condition.

D. Upon Final Acceptance, the CONSTRUCTION SIGN shall be removed by the Contractor.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 65 00
PRODUCT DELIVERY REQUIREMENTS

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall make all arrangements for transportation, delivery, and handling of equipment and materials required for prosecution and completion of the Work.

B. Working space at the Site is limited. Materials shall not be delivered to the Site until ready to be utilized.

C. If necessary to move materials stored during construction by the Contractor, the Contractor shall move the materials without any additional compensation. The Contractor shall coordinate the removal or relocation of materials stored onsite by others, at no cost to the City.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 66 00 – Protection of Materials and Equipment

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Supporting Heavy Loads

The Contractor shall, in all cases where heavy loads are to be temporarily imposed on existing slabs, ensure the slab's load sustaining ability. Whenever heavy loads are to be stored or temporarily imposed on slabs, the Contractor shall submit to the Engineer for approval, a plan of procedure prepared by a currently licensed New York State Professional Engineer, indicating a structural analysis of the slabs and methods of distributing loads, and providing auxiliary support so that slabs and beams are not loaded in excess of their design loadings.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

CONTRACT GI-CONS-7
SECTION 01 65 00
PRODUCT DELIVERY REQUIREMENTS

PART 3 EXECUTION

3.01 DELIVERIES OF PRODUCTS

A. The Contractor shall arrange deliveries of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.

B. Coordinate deliveries to avoid conflict with Work and conditions at the Site and to accommodate the following:

1. Work of other contractors.

2. Limitations of storage space.

3. Availability of equipment and personnel for handling products.

C. Do not have products delivered to project Site until related Working Drawings including manufacturer's recommended storage instructions have been approved by the Engineer.

D. Do not have products delivered to Site until required storage facilities have been provided.

E. Products shall be delivered to the Site in manufacturer's original, unopened, labeled containers. Keep the Engineer informed of delivery of all products to be incorporated in the Work.

F. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts and to facilitate assembly.

G. Immediately upon delivery, inspect shipments to assure:

1. Product complies with requirements of Contract Documents and approved submittals.

2. Quantities are correct.

3. Containers and packages are intact, and labels are legible.

4. Products are properly protected and undamaged.

3.02 HANDLING OF PRODUCTS

A. Provide equipment and personnel necessary to handle products by methods to prevent soiling or damage to products or packaging.

B. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.

C. Handle products by methods to prevent bending or overstressing.

D. Lift heavy components only at designated lifting points.

E. Materials shall at all times be handled in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them. Do not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

3.03 INSPECTION OF ITEMS

A. The Contractor shall inspect all items including all boxes, crates, and packages containing materials for damage that may have occurred during shipment prior to its removal from the truck or other conveyance. Any damage shall be reported immediately to the Engineer.

B. The Contractor shall then carefully remove the materials from the truck or trucks on which it is shipped. The materials shall then be transported to the place of utilization at the job Site. The Contractor shall be liable for loss or damage to the materials that may occur while being unloaded, transported, stored or being utilized.

C. All material that arrives at the job Site during normal working hours shall be unloaded as soon as practicable.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 66 00
PROTECTION OF MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall make all arrangements for transportation, delivery, and handling of equipment and materials required for prosecution and completion of the Work.

B. Working space at the Site is limited. Materials shall not be delivered to the Site until ready to be utilized.

C. If necessary to move materials stored during construction by the Contractor, the Contractor shall move the materials without any additional compensation. The contractor shall coordinate the removal or relocation of materials stored onsite by others, at no cost to the City.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 65 00 – Product Delivery Requirements

1.03 PAYMENT

A. There will be no separate payment for the work specified herein. The costs shall be considered incidental to the work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 STORAGE OF PRODUCT

A. Transport and handle products in accordance with manufacturer's instructions.

B. Handle and lift products only at designated lift points and by methods to avoid soiling, disfigurement, bending, overstressing, and damage.

C. Store products on shelves, in bins, or in neat groups of like items, with seals and labels intact and legible, and in a matter to provide access for maintenance and inspection.

D. Store loose granular materials on clean, solid, flat surfaces and prevent mixing with foreign matter. Provide surface drainage to prevent erosion and ponding of water.

E. Cover products subject to discoloration or deterioration with impervious sheet covering and protect products from soiling and staining

F. Store and protect products, which are subject to damage by the elements, in weather tight, climate controlled enclosures and according to the manufacturer's instructions.

G. Attach applicable manufacturer's service instruction labeled "SERVICE INSTRUCTIONS ENCLOSED" to exterior of each stored product.

H. Inspect stored products on a regularly scheduled basis, consistent with manufacturer's instructions.

I. Record inspections performed and keep log available for review by DEP and the Engineer.

3.02 PROTECTION OF MATERIALS

A. The Contractor shall make every effort to minimize extended storage periods of materials and equipment at the Site by judiciously scheduling deliveries to coincide with construction needs.

B. Storage of any mechanical or electrical equipment outdoors at any time is absolutely prohibited regardless of the protection furnished. Storage of mechanical and electrical equipment within structures at the Site will not be permitted unless the structures are enclosed. A structure shall be considered to be enclosed when it is roofed and has protection of doorways, windows and other opening closures.

C. All mechanical and electrical equipment must be coated, wrapped and otherwise protected from snow, rain, drippings of any sort, dust, mud condensed water vapor, etc., during shipment, storage, and installation and until placed in service.

D. All storage areas for motors must be heated. Contractor to provide space heaters as required, in all enclosures being utilized for storage of motors. Motors equipped with space heaters must be properly wired and the heaters activated while in storage.

E. In the event that storage of mechanical and electrical equipment becomes necessary prior to delivery to the Site, the Contractor shall provide storage in a weatherproof warehouse.

F. Materials other than mechanical and electrical equipment may be stored outdoors if supported above ground surface on wood runners and protected with approved, effective and durable covers.

G. All storage and protection of materials and equipment at the Site are subject to the approval of the Engineer.

H. Prior to installation of the equipment, the Contractor shall have the manufacturer inspect the equipment and certify in writing that its condition has not been detrimentally affected by a long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not given, the equipment is deemed to be defective, and must be removed and replaced at the Contractor's expense.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 71 30
PROTECTION AND RESTORATION OF STRUCTURES

PART 1 GENERAL

1.01 REQUIREMENTS

A. Each Contractor shall execute the Work to prevent damage or injury to existing facilities, adjacent private properties and occupants thereof, which might result from work or other causes, and so as not to interfere with the use, and free and safe passage to and from the Site.

B. Each Contractor shall erect and maintain barriers, lights, fences, and other required protective devices in accordance with the Contract Documents, the NYC Building Code, and the NYCDOT requirements.

C. Each Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage, injury, loss or vandalism.

D. In order to prevent damage, injury or loss, the Contractor's actions shall include, but not be limited to, the following:

1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor, utility source company or Site operations.

2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.

3. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his/her operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance (see Section 01 74 17 – Cleaning and Site Maintenance).

4. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work (see Section 01 65 00 – Product Delivery Requirements).

E. The Contractor shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the Site. During the execution of the Work by the Contractor, any direct or indirect damage to public and private property or facility on or adjacent to the Site by or on account of any act, omission, neglect or misconduct by the Contractor, shall be restored, at Contractor’s expense, to a condition equal to that existing before the damage. Where necessary to protect the Work or materials from damage, the Contractor shall, at his/her expense, provide suitable drainage and erect such temporary structures as are necessary to protect the Work or materials from damage. The suspension of the Work or the granting of an extension of time from any cause whatsoever shall not relieve the Contractor of his/her responsibility for the Work and materials.

F. Whenever any notice is required to be given by DEP or the Contractor to the property owner or other party before commencement of any Work, such notice shall be given by the Contractor within the time limitations required for such notices. Refer also to requirements for coordination with occupants listed in Section 01 14 00 – Work Restrictions.

G. All structures and appurtenances shall be adequately supported and safeguarded against all damage or injury in performance of Work under this Contract. Work under this Contract includes, but is not limited to, excavation, backfilling, and other subsurface activities. The Contractor will be held responsible for any such damage or injury resulting from his/her operations and shall repair such damage immediately and to the satisfaction of the Engineer.

H. The Contractor shall ascertain the location of underground pipe lines, conduits and other subsurface structures in those locations where the operation of his/her heavy construction equipment might damage such structures. The Contractor shall either avoid such locations or provide the necessary safeguards and repair any damage quickly at his/her own expense.

I. The Contractor shall comply promptly with such safety regulations as may be prescribed by the Engineer or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of his/her employees. In the event of the Contractor's failure to comply, the Engineer may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of his/her responsibility hereunder.

J. Prior to commencement of Work in the vicinity of property adjacent to the Site, the Contractor, at his/her own expense, shall take such surveys as may be necessary to establish the existing condition of the property (see Section 01 32 30 – Job Photographs and Videos).

K. The Contractor shall completely enclose private utility services (including water service) by use of split sleeve HDPE or PVC Pipe at all private utility crossings through green infrastructure. The sleeving is in addition to any provisions that the Contractor would normally follow to safeguard the Contractor’s Work operations and in no way relieves the Contractor’s obligations as provided in the Contract.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 14 00 – Work Restrictions

B. Section 01 32 30 – Job Photos and Videos

C. Section 01 65 00 – Product Delivery Requirements

D. Section 01 74 17 – Cleaning and Site Maintenance

E. Section 33 42 11 – Stormwater Gravity Piping

1.03 PAYMENT

A. There will be no separate payment for the work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telecommunication, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

B. Where existing utilities and structures are indicated on the Contract Drawings, it shall be understood that all of the existing utilities and structures affecting the Work may not be shown and that the locations of those shown are approximate only. Contractor shall ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any Work in the vicinity of existing utilities.

C. The Work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Contractor shall provide or arrange for temporary connections, as required, to ensure no interruption of existing services. Any damage resulting from the Work of this Contract shall be promptly repaired by the Contractor at its own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. The Contractor shall be responsible for all costs thereof.

D. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction Work, such support and protection shall be provided by the Contractor. All such Work must be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such Work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at his/her discretion, have the respective authority to provide such support or protection as may be necessary to ensure the safety of such utility, and the costs of such measures will be paid by the Contractor.

E. During the progress of the Work, the Contractor shall protect from injury any existing utilities or services within the Work area until, if required, they have been re-routed, disconnected or capped off. Protection and re-routing must conform to standards established by the utilities, agencies and governing codes.

3.02 UNDERGROUND STRUCTURES

A. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, manholes, underground sewage conduits, plant outfall, Regulator structure, chambers, electrical and signal conduits, tunnels and other existing subsurface Work located within or adjacent to the limits of the Work.

B. All underground structures known to the Engineer on the Contract Documents are provided in accordance with the best information available for the Contractor's convenience, but are not guaranteed to be correct or complete.

C. The Contractor shall explore the site ahead of any trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If the Contractor damages an underground structure, it shall be restored to its original condition at the Contractor's expense.

D. Necessary changes in the location of the Work may be made by the Engineer, to avoid unanticipated underground structures.

E. If the Contractor discovers utility facilities not identified in the Contract Documents or in a position different from that shown in the Contract Documents, it shall immediately notify in writing the Engineer and the owner of the utility facility.

3.03 SURFACE STRUCTURES

A. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface including foundations or any portion thereof which extends below the surface.

B. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

3.04 PROTECTION OF UNDERGROUND AND SURFACE STRUCTURES

A. The Contractor shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, the Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.

B. The Contractor shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his/her work to any structure. The Contractor shall repair immediately all damage caused by his/her work, to the satisfaction of the owner of the damaged structure.

C. The fact that any structure or facility is not shown on the Contract Drawings shall not relieve the Contractor of his/her responsibility of protecting and preserving the structure or facility.

D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at the Contractor's expense.

3.05 SLEEVING OF UTILITIES

A. The Contractor shall completely enclose private utility services (including water service) by use of split sleeve HDPE or PVC Pipe provided in accordance with the requirements of Section 33 42 11 – Stormwater Gravity Piping at all private utility crossings through On-Site Green Infrastructure Practices as shown on the DEP Standard Designs and Guidelines for Green Infrastructure Practices.

B. Pipe shall be split sleeve HDPE or PVC with diameter two (2) times the diameter of the existing utility service as shown on the DEP Standard Designs and Guidelines for Green Infrastructure Practices.

C. A watertight expanding foam sealant will be installed between the utility service and the sleeve as shown on the DEP Standard Designs and Guidelines for Green Infrastructure Practices.

3.06 RESTORATION OF STRUCTURES AND PAVEMENTS

A. DEP shall not be liable for any costs incurred by the Contractor as a result of the compliance, non-compliance, or improper compliance by the franchised operators of underground facilities, with Subpart 53-3 of Rule 53 of the Industrial Code.

B. DEP shall not be liable for any costs incurred by the Contractor for the support, protection and maintenance of underground facilities owned by franchised operators of such facilities.

1. Restoration of hydrants and hydrant connections and all other City structures must conform with the requirements of the Contract Documents of the respective Agencies having jurisdiction over the structures (i.e.: Bureau of Water Supply, Bureau of Traffic Operations, NYCDOB, NYCDOT, and the FDNY.)

2. Restoration of pavements must conform to the requirements of the NYCDOT Standard Highway Specifications, latest edition. These Specifications may be examined at the NYC Office of the Department of Transportation, Bureau of

Highway Operations, 40 Worth Street, New York, New York. The Contractor shall give the Department of Highways four weeks written advance notice before proceeding with final restoration of pavements, walks and curbs.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 74 17
CLEANING AND SITE MAINTENANCE

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes the requirements for maintenance of the Site.

B. Maintenance of the Site will be done in accordance with New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 7.13 - Maintenance of Site.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

B. Section 01 50 00 – Temporary Facilities and Controls

D. Section 01 74 20 – Construction Waste Management.

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Department of Transportation (NYCDOT) Standard Highway Specifications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 01 74 20
CONSTRUCTION WASTE MANAGEMENT

PART 1 GENERAL

1.01 REQUIREMENTS

A. Requirements for construction waste management.

B. Disposal of Waste Materials

1. All waste material shall be promptly removed from the site and disposed of legally.

2. Do not dispose of organic or hazardous material on site.

3. Do not dispose of construction debris either by burial or by burning.

4. All hazardous material shall be removed from the site on a daily basis.

5. No storage of debris shall be permitted.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 14 00 – Work Restrictions

B. Section 01 33 00 – Submittal Procedures

C. Section 02 26 00 – Hazardous Material Assessment

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE

A. NYC Recycling Law: Local Law 19 (1989)

B. Local Law 87 (1992)

C. NYC's Commercial Recycling Regulations: Rules Governing the Recycling of Private Carter-Collected Waste (September 1993)

D. NYSDEC Hazardous Waste, Universal Waste and Used Oil Regulations

E. USDOT 49 CFR Hazardous Material Transportation Regulations

F. DEC Part 364 Waste Transporter Permit

1.06 SUBMITTALS

A. The Contractor shall prepare and submit a Construction Waste Management Plan for review and approval by the Resident Engineer within fifteen (15) days after receipt of Notice to Proceed and prior to the removal of any construction waste or demolition materials from the project Site. Submittals shall be provided in accordance with the requirements of Section 01 33 00 – Submittal Procedures.

B. The Construction Waste Management Plan shall contain the following:

1. Analysis of the proposed job Site waste to be generated during the full construction period, including types and anticipated quantities of each. The list of construction waste materials shall include, at a minimum, but may not be limited to, the following materials:

a. Cardboard
b. Clean dimensional wood
c. Demolition debris
d. Concrete
e. Bricks
f. Concrete masonry units ("CMU")
g. Asphalt
h. Metals from rebar, sheetrock studs, framing, etc.
i. Steel sheet piling
j. Steel pipe piles
k. Structural steel
l. Paints, solvents, and other hazardous fluids
m. Glass
n. Roofing
o. Wood pallets
p. Fencing materials
q. Mercury containing light bulbs from the Contractor’s office
r. Recyclable office wastes such as paper and toner and ink cartridges that should be recycled.

2. Materials Handling Procedures: A description of the means by which any construction waste materials listed above will be appropriately segregated and not mixed in order to prevent cross-contamination as well as a description of the means to be employed in recycling the above materials consistent with requirements of the New York City Department of Sanitation (DSNY).

3. The Construction Waste Management Plan must specify a list of waste transporters, transfer stations, disposal facilities and recyclers with addresses, phone numbers, and permits which the Contractor intends to utilize during the construction period for the purpose of complying with the Construction Waste Management Plan. The Plan should list where the non-recyclable materials will be disposed.

4. Transportation: A description of the means of transportation of the recyclable and non-recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste transporter and removed from the Site) and destination of such materials.

5. Hazardous wastes: The Construction Waste Management Plan must specifically note the proper method of disposal for anticipated hazardous wastes or potentially hazardous wastes such as resins, epoxies, waterproofing agents, waste paints, solvents, and other hazardous fluids, expended 55-gallon drums, concrete curing compounds, etc. The Plan must state that the hazardous waste transporter must hold a current New York State Part 364 Waste Transporter Permit. (https://dec.ny.gov/environmental-protection/waste-management/waste-transporters) in accordance with NYCRR Part 364. The permit must authorize the transporter to take the hazardous waste to the Transportation, Storage and Disposal Facility ("TSDF") identified in the permit. The Construction Waste Management Plan must state that the hazardous waste will be transported in compliance with USDOT Hazardous Materials Transportation regulations in Title 49 of the CFR.

6. Universal wastes: The Construction Waste Management Plan must specifically identify the proper method of handling of universal wastes (e.g., mercury containing bulbs, batteries). Universal wastes must be managed in compliance with 6 NYCRR Part 374-3 and with USDOT 49 CFR Hazardous Materials Transportation regulations.

7. Non-hazardous wastes: The Construction Waste Management Plan must specifically note the proper method of disposal of anticipated non-hazardous waste such as oily rags. The Plan must state the transporter must hold a current New York State Part 364 Waste Transporter Permit to transport the waste to a TSDF that accepts non-hazardous waste.

8. The Construction Waste Management Plan must include the method of recycling office materials such as clean white paper, mixed paper, toner cartridges for laser printers, copiers and fax machines. Each item must be recycled in accordance with the manufacturer's instructions.

9. The Construction Waste Management Plan must include the coordination of product deliveries to designated prepared areas in order to minimize Site storage time and potential damage to stored materials and the return of packing materials, such as wood pallets, 55-gallon drums, etc., where economically feasible.

10. Refer to additional requirements for work performed on New York City Department of Parks and Recreation property listed in Section 01 14 00 – Work Restrictions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONSTRUCTION WASTE MANAGEMENT

A. The Contractor shall use construction and demolition methods and processes to ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors. Where economically feasible, as many of the materials from the generated waste as possible shall be salvaged, reused, or recycled.

B. When encountered as part of its work for sites within New York City, the Contractor shall dispose of construction and demolition waste by recycling methods in accordance with the NYC Recycling Law: Local Law 19 (1989) and Local Law 87 (1992), and NYC's Commercial Recycling Regulations: Rules Governing the Recycling of Private Carter-Collected Waste (September 1993), and any amendments or updates thereto. Under these rules, waste materials to be recycled shall include concrete, metals, and rock. In addition, the Contractor shall also arrange for disposal by recycling of untreated wood (scrap wood, pallets, etc.), green wood (stumps and tree parts), asphalt, brick and concrete block. All material to be recycled must be separated from normal refuse, per NYCDOS Rules. Normal refuse and material not required to be recycled must be disposed of by the Contractor as specified and in accordance with all State and Local codes and laws.

C. When encountered as part of any Work for sites outside New York City, the Contractor shall dispose of construction and demolition waste by recycling methods in accordance with all relevant State, county and local codes, laws, rules and regulations. All hazardous waste, universal waste, and used oil must be separated and stored in their own dedicated storage areas and managed in compliance with NYSDEC Hazardous Waste, Universal Waste and Used Oil Regulations (Waste Transporters - NYSDEC) and USDOT 49 CFR Hazardous Material Transportation Regulations (http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfrv2_02.tpl) and in accordance with Section 02 26 00 – Hazardous Material Assessment, Universal Waste Management, and Used Oil Policies and Procedures.

3.02 HANDLING AND STORAGE

A. The Contractor shall designate separate receiving/storage areas for delivered materials and equipment in order to minimize waste due to excessive materials mishandling, misapplication, weather and other damage.

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SECTION 01 74 20
CONSTRUCTION WASTE MANAGEMENT

END OF SECTION

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SECTION 01 78 39
FINAL RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS

A. This Section describes the requirements for all final record documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 32 30 – Job Photographs and Videos

B. Section 01 33 00 – Submittal Procedures

C. Section 02 21 00 – Site Surveys

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ANSI/NISO Z39.48, Permanence of Paper for Publications and Documents in Libraries and Archives. This Standard may be obtained in electronic format from HTTP://WWW.NISO.ORG.

B. Library of Congress - Preservation Photocopying. This publication may be obtained in electronic format from the Department of Environmental Protection.

C. National Archives and Records Administration Technical Information Paper No. 5, Tape Pull Test. This publication may be obtained in electronic format from the Department of Environmental Protection.

D. National Archives and Records Administration - Peel Test target. This publication may be obtained in electronic format from the Department of Environmental Protection.

E. Adobe Reference Specification for TIFF, revision 6.0 (1992).

F. ANSI/AIIM MS44 – Recommended Practice for Quality Control of Image Scanning

G. ANSI/AIIM MS52 – Recommended Practice for the Requirements and Characteristics of Original Documents Intended for Optical Scanning

H. ANSI/AIIM TR34 – Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management and Micrographic Systems

I. ISO/19005-1 - Document management -- Electronic document file format for long-term preservation -- Part 1: Use of PDF 1.4 (PDF/A-1)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Except where otherwise specified, the Contractor shall submit the following Final Record Documents according to the requirements of Table 1 and as specified herein:

1. As-Built Drawings
2. Final Copy Shop Drawings
3. Approved Working Drawings
4. Key Documents
5. Job Photographs
6. Job Videos
7. Additional Documents

B. Submittal of these documents shall be a condition precedent to Final Acceptance under Article 45 of the Standard Construction Contract.

1.07 QUALITY CONTROL (NOT USED)

1.08 DEFINITIONS

A. **Archive.** In this Section, to "archive" shall mean to furnish as a final record document.

B. **As-Built Drawings.** The “As-Built Drawings” reflect the “as constructed” final product. These drawings must use the same title blocks and sheet numbers as the original “Contract Drawings”, with the exception that an “AB” is prefixed onto the original drawing number.

C. **Final Copy Shop Drawing ("FCSD")**. The "Final Copy Shop Drawing" must be the approved copy (Furnish as Submitted (FAS), Furnish as Noted (FAN), or Furnish as Corrected (FAC)) of the Shop Drawing corrected to reflect any deviations made for the installed condition showing the actual construction.

D. **Conformed Drawings:** The Conformed Drawings are the original Bid Set Contract Drawings modified to incorporate the changes made by addenda to the Invitation for Bids issued during the bid period.

E. **Conformed Set Contract:** The Conformed Set Contract is the original Bid Set Contract modified to incorporate the changes made by addenda to the Invitation for Bids issued during the bid period.

F. **Bid Set Drawings (or Design Drawings):** The Bid Set Drawings consist of the original Contract Drawings issued by DEP with the Invitation for Bids.

G. **Bid Set Contract (including Addenda):** The Bid Set Contract is the text of the original Contract (excluding Contract Drawings) issued by DEP with the Invitation for Bids, including any Addenda issued during the bid period.

H. **Change Orders**. The "Change Orders" must include registered "Change Order Forms" and the complete sets of attached text and/or drawings for all Design and Field Change Orders.

I. **Key Documents.** Key Documents must include, but not be limited, to the following items:

1. Signed copy of the Contract (including Bonds);
2. Signed and submitted Bid Schedule of Prices;
3. Award Folder Contents;
4. Contract Award Letter;
5. Notice to Proceed Letter;
6. Approved Detailed Estimate Breakdown;
7. Written determination by the Engineer or Resident Engineer, as applicable, that the Work is substantially complete, as described in Article 14 of the Standard Construction Contract;
8. Final Approved Punch List;
9. Final evaluation;
10. Final extension of time (if applicable);
11. Claim settlements (if applicable);
12. Warranties;
13. Survey (per Article 9 of the General Conditions);

J. **Job Photographs and Videos.** "Job Photographs and Videos" must be prepared by the Contractor specified in Section 01 32 30 – Job Photographs and Videos and shall conform to the requirements of that Section.

K. **Additional Documents.** These shall be any “Additional Documents” that the Engineer directs to be furnished as a “Final Record Document” in accordance with the requirements of this Section.

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SECTION 01 78 39
FINAL RECORD DOCUMENTS

1.09 PAPER RECORDS

A. All records in paper formats must be produced in conformity with Article 2.01 of this Section – Records in Paper Formats.

1.10 ELECTRONIC RECORDS

A. All records in electronic format must be produced in conformity with Article 2.02 of this Section – Records in Electronic Formats.

1.11 SUBMITTALS

A. Formats

1. The Contractor shall submit the final record documents in electronic and paper formats, according to the requirements of Table 1 – Summary of Final Record Documents to be Furnished, attached at the end of this Section.

B. Quantities

1. The quantities and formats to be furnished for each Final Record Document shall be as shown in Table 1.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Final Record Documents shall be delivered to the Engineer.

1.12 AS-BUILT DRAWINGS

A. The Contractor shall create an As-Built Drawing Set by revising the Conformed Drawings in .DWG or .RVT or in some cases a combination of both formats conforming to ISO 13567 and the NYCDEP BIM/CAD Standard Manual. If no Conformed Drawings were created, then the Contractor shall use the original Bid Set Drawings. When using the Conformed Drawings, the Contractor shall independently confirm that the changes made by the Addenda to the original Bid Set Drawings were correctly reflected in the Conformed Drawings. Files submitted in .DWG or .RVT format will be bound to include all related matter (e.g., base files, font files and shapes). If submitting in .RVT format, the file must contain the 3D discipline models, discipline links, and all associated drawing sheets. Each file shall be viewable and printable in its entirety without recourse to external files. In addition to .DWG or .RVT or a combination of both formats of deliverables, the Contractor shall also submit a point cloud deliverable, supplied in industry-standard formats such as .RCP/.RCS, and shall accurately capture the completed conditions of the project and be aligned to the established project coordinate system.

B. The Contractor shall use the information compiled during construction to create an As-Built Drawing Set. The Contractor shall document any deviations and/or changes from the configurations shown on the original Contract Drawings or revised drawings issued during the course of executing the Work including Change Orders, Design During Construction

(DSDC) memoranda and Requests for Information (RFIs). These deviations and/or changes shall generally relate to topographic features, relocation of structures, or locations of underground items such as pipelines, duct banks, manholes or footings. Survey distances, coordinates and/or elevations must be included to accurately locate all such items. All deviations and/or changes shown shall be field verified.

C. The Contractor should have the electronic files of the Contract Drawings. However, should the Contractor require an additional copy, the Engineer will supply the Contract Drawings in AutoCAD files upon written request, if such copies are available. The AutoCAD files will consist of a bound set of drawings.

D. Drawing Size – The As-Built Drawings are to be the same size as the full-size Contract Drawings (22-inches by 34-inches).

E. The new As-Built Drawing number shall be generated as per the following steps:

1. The As-Built Drawing number is the original Bid Set Drawing number prefixed by an “AB” for As-Built.

    a. Example: If the drawing number for a Contract Drawing is 36G-02S-14, the As-Built Drawing number will be “AB36G-02S-14”.

2. If a new drawing is produced, its number can be added to the end of the series (i.e., if 14 is the last drawing in the series, then the first new drawing becomes 15; the second new one becomes 16, etc.).

3. If a new drawing is inserted into the middle of a series, it is assigned a letter suffix starting with A (i.e., 02A, 02B, etc.).

    a. Example: If the drawing number for a Contract Drawing is 36G-02S-02, the new, additional As-Built drawing will be numbered “AB-36G-02S-02A”.

F. Designation – The designation “As-Built Drawing” is to be added to the drawing. Insert the words “As-Built Drawing” above the title box in the right hand corner of the drawing. (Do not include the quotation marks in “As-Built Drawing” when marking the drawing.)

G. Modifying the Contract Drawings – Prior to submitting an As-Built Drawing made from a Contract Drawing for review and acceptance, the Contractor is to create a "clean" finished copy of the drawing by undertaking the following:

1. Remove all signatures and certifications from the Contract Drawing

2. Remove all previous revisions and references from the revision boxes

3. Remove the Professional Engineers seal, Engineer’s company names, and any initials from the drawing title block

4. Modify all of the original title boxes to show the Contractor information including the name of the Contractor and the date.

5. Remove all previous markings – notes, revision indicators, balloons, submittal stamps, etc. – from the drawing.

H. Contractor's Information – The Contractor's name, address, contact information and date (month and year) the project is completed is to be added to the drawing. Place this information in the title block in the space previously utilized for the Engineer's name.

I. Adding Revisions – Items/areas changed are to be enclosed within a cloud line. The revision cloud layer is to be a 0.024-inch line thickness.

J. The Contractor shall submit copies of the As-Built Drawings for review and approval by the Engineer. These submittals shall show the deviations and changes from the original Design Drawings by using red-line mark-ups. The Contractor shall make modifications to the submitted As-Builts as required by the Engineer. In the final, approved set of As-Built Drawings, the red lines shall be converted to black.

K. The final approved set of As-Builts shall have the following statement on the cover sheet:

"These As-Built Drawings for Contract ###, as prepared by XYZ Company, have been prepared as Record Copy Drawings."

The above statement must be signed by the representative of the Contractor. The signer shall be identified along with the Contractor.

1.13 FINAL COPY SHOP DRAWINGS ("FCSD")

A. The Contractor shall furnish all FCDSs to the DEP.

1. The FCSD must be the approved copy ("FAS" or "FAC") of the Shop Drawing corrected to reflect any deviations made for the installed condition showing the actual construction.

B. In addition to submitting the FCSDs as a final item at the end of construction, each Contractor shall prepare and submit FCSDs for approval on a continual basis during the performance of the project when the particular item of work for a FCSD has been completed. The Contractor shall submit the FCSD within thirty (30) days after the completion of the Work item.

C. The drawing revision boxes must have all previous revisions and references removed from the drawings. The revision boxes shall indicate "Final Copy Shop Drawing".

D. Each drawing must bear the original submittal file number, without the revision number, which must be written in the lower right hand corner of a drawing above the title box. The file number must also have a prefix, which identifies it a FCSD. Additionally, the Contract Name must be added if it does not appear in the original file number.

1. For example, if the file number for an approved Shop Drawing is 26 05 91-002, the FCSD will be numbered “FCSD-26 05 91-002”.

E. Supporting Documentation: Supporting documentation must bear the correlating FCSD file number so as to identify it. All supporting documentation (e.g. catalog cuts, test results, calculations, etc.) must be submitted, together with the related FCSD so as to maintain a complete set of all documents submitted with each FCSD.

1. Submittal for Approval. Two (2) full size paper prints of each drawing shall be submitted for approval. The drawing shall be checked by the Resident Engineer against the field records and a copy will either be stamped "Approved" or returned with comments for correction and re-submittal by the Contractor. The Contractor shall retain one (1) approved set of the FCSDs for use in submitting the entire set in paper and electronic copies.

1.14 BID SET CONTRACT

A. If the Contractor does not have a complete set of the original Bid Set Contract (including Addenda) in the original PDF format (non-scanned), it may request a set from the Engineer. Upon request, the Bid Set Contract and Addenda will be provided to the Contractor in PDF format if possible. If a PDF format is not available, then a paper copy set may be utilized. This may also be requested from the Engineer if required and shall be provided if possible.

B. The Contractor shall Archive the entire set of Contract Documents, except Contract Drawings, as discussed below. This set shall include all the sequential pages of the Contract Documents and shall include:

1. Front and Back Covers
2. Invitation for Bids
3. Information for Bidders
4. Table of Contents
5. Notice to Bidders
6. Standard Construction Contract
7. General Conditions
8. Schedule of Wage Rates
9. Specifications Sections
10. Addenda

C. On a multiple contract project, the Electrical ("E"), Plumbing ("P"), and Heating (“H") Contractors shall only archive the Detailed Specifications respective to their work. These are only required in the electronic Archives. No paper version is required as that will be produced by the “G” Contractor.

D. The signed (executed) parts of the Standard Construction Contract must be included by each contractor as part of the Key Documents.

1.16 BID SET DRAWINGS (DESIGN DRAWINGS).

A. The Bid Set Drawings shall be Archived. If the Contractor does not have a complete set of the original Bid Set Drawings in .DWG or .RVT format, the Contractor may request a set from the Engineer. If possible, the Bid Set Drawings will be provided to the Contractor in .DWG or .RVT format, bound with their respective data sets.

1.17 CONFORMED DRAWINGS

A. The Conformed Set Contract shall be Archived.

1.18 CHANGE ORDERS

A. All change orders (both field and design) produced during the construction of the projects shall be Archived.

1.19 KEY DOCUMENTS

A. Key Documents produced during the construction of the Projects shall be Archived. They shall consist generally of the items defined above.

1.20 ADDITIONAL DOCUMENTS

A. Any additional Documents such as Soil Classification Reports, Environmental Impact Statements, Site Assessments, Geotechnical Reports, permits, RFI's, etc. shall also be archived when directed by the DEP. If the Contractor does not have copies of any documents, they will be provided by the Engineer in electronic or paper format, where possible.

1.21 PHOTOGRAPHIC RECORDINGS

A. Job Photographs and Videos shall be produced during the performance of the Work shall be Archived.

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SECTION 01 78 39
FINAL RECORD DOCUMENTS

Table 1 **Summary of Final Record Documents To Be Furnished**			
Final Record Document Type	**Final Record Document Type**	**Final Record Document Type**	**Final Record Document Type**
As-Built Drawings	As-Built Drawings	As-Built Drawings	As-Built Drawings
Final Copy Shop Drawings	Final Copy Shop Drawings	Final Copy Shop Drawings	Final Copy Shop Drawings
Conformed Drawings	Conformed Drawings	Conformed Drawings	Conformed Drawings
Bid Set Drawings	Bid Set Drawings	Bid Set Drawings	Bid Set Drawings
Bid Set Contract (including Addenda)	Bid Set Contract (including Addenda)	Bid Set Contract (including Addenda)	Bid Set Contract (including Addenda)
Conformed Contract	Conformed Contract	Conformed Contract	Conformed Contract

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FINAL RECORD DOCUMENTS

PART 2 PRODUCTS

2.01 RECORDS IN PAPER FORMATS

A. Summary

1. This Section describes the requirements for all Final Record Documents to be produced in paper formats.

2. Expected longevity of paper documents without significant deterioration under normal use and storage conditions. C. Properties of the paper and of the printing processes, and the tests required to demonstrate these properties.

B. References

1. Definitions

a. Small-Format Documents: documents sized 11 by 17 inches or smaller.

b. Large-Format Documents: documents sized larger than 11 by 17 inches.

2. Reference Standards:

a. ANSI/NISO Z39.48 - Permanence of Paper for Publications and Documents in Libraries and Archives

C. Final Record Documents:

1. Drawings –

a. Provide full size, paper copies of the Final Copy Shop Drawings and As-Built Drawings (if required).

i. Bid Set and Conformed Drawings are not required to be furnished as paper copies but must be furnished as part of the electronic archives.

b. Paper copies are to be produced from electronic copies.

2. Bid Set – Contract

a. A single set of the Bid Set Contract in paper format shall be provided by the Contractor, and it shall be identical to the copy distributed for bid. They shall be furnished as bound volumes.

b. All Addenda shall be produced in paper format by the Contractor. Each Addendum shall be bound separately and include all attachments including sketches and drawings. Drawings shall be attached using half-size drawings (11 inches x 17 inches).

D. Key Documents

1. Key Documents, as defined herein, are not required to be produced in paper format.

E. Change Orders

1. Change orders are not required to be produced in paper format.

F. Job Photographs

1. The job photographs are not required to be produced in paper format for purposes of the Final Record Documents.

G. Additional Documents

1. Additional Documents are not required to be produced in paper format.

H. Quality Assurance

1. Testing

a. Test Method: All printing processes and materials used to produce the documents covered by this Section shall be tested periodically to ensure proper function, using the National Archives and Records Administration Technical Information Peel Test.

b. Test Frequency: All printing processes and materials used to produce the documents covered by this Section shall be tested not less than twice a day, once at the beginning of the work day, and once at the end of the work day.

2. Inspections

a. DEP may carry out inspections of the production facilities without notice.

I. Submittals

1. Paper Certification: All documents covered by this Section shall be accompanied by a certification from the manufacturer of the paper that it complies with ANSI/NISO Z39.48.

2. Printing Test Certification: The organization that operates the printing processes and materials used to produce the documents covered by this Section shall submit the following documentation as proof that the tests have been carried out:

a. An affidavit, signed by the supervisor responsible for the production area, certifying that the tests have been performed in accordance with the procedures described in the National Archives and Records Administration Peel Test.

b. All of the Peel Test targets actually used to perform the tests.

J. Materials / Equipment

1. Properties of Paper

a. All paper used for documents covered by this Section shall conform to the standards of ANSI/NISO Z39.48, as amended herein, for pH, tear resistance, alkaline reserves and paper stock.

b. Paper Stock

i. Uncoated paper shall be used.

ii. Uncoated paper shall not be less than 24 pounds basis weight.

2. Printing Processes

a. Small Format Documents, With Color Images and with Black and White Images

i. Only electro-photographic printing shall be used.

(a) When color electro-photographic printing is used, the process shall be certified by the manufacturer of the printer as not soluble in water, chemically stable, and resistant to fading, for a period of not less than 50 years. All documents printed using a color electro-photographic printer shall be accompanied by a certification from the manufacturer of the printer that the process is in compliance with this requirement.

ii. Large-Format Documents, With Black and White Images

(a) Only electro-photographic printing shall be used. Large-Format Documents shall be printed in black and white, unless color is an essential information component of the document. An example of documents where color may be an essential information component is a topographic drawing produced from data in a Geographic Information System. Color prints, when required, shall comply with the provisions specified below.

iii. Large-Format Documents, With Color Images and with Black and White Images

(a) Either electro-photographic or inkjet printing shall be used. When inkjet printing is used, a formulation of ink shall be used that is certified by the manufacturer of the printer as not soluble in water, chemically stable, and resistant to fading, for a period of not less than 50

years. All documents printed using an inkjet printer shall be accompanied by a certification from the manufacturer of the inks that the inks are in compliance with this requirement.

2.02 RECORDS IN ELECTRONIC FORMATS

A. General

1. This Article describes the requirements for the electronic records for the items specified herein.

2. This Article does not cover digital objects which include a time base correction code (e.g., analogue or digital video recordings, analogue or digital audio recordings, instrumentation data feeds, etc.), or geo-coded objects (produced by Geographic Information Systems-GIS).

3. Exhibit A – Folder Structure.

B. Reference Standards

1. ANSI/AIIM MS44 – Recommended Practice for Quality Control of Image Scanning

2. ANSI/AIIM MS52 – Recommended Practice for the Requirements and Characteristics of Original Documents Intended for Optical Scanning

3. ANSI/AIIM TR34 – Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management and Micrographic Systems

4. ISO/19005-1 - Document management -- Electronic document file format for long-term preservation -- Part 1: Use of PDF 1.4 (PDF/A-1)

C. Definitions

1. Archive. In this Section, to "archive" means to furnish as a final record document.

2. Metadata - Metadata is commonly defined as "data about data." For the purposes of this specification metadata refers to the "descriptive metadata" that describes the content and form of the construction records known as "final record documents" (i.e. contract name, document date, construction phase, engineer of record, etc.) and supports the discovery (searching) and identification of the resources. See Section 1.21.13B.

3. Portable Document Format-Archival (PDF/A) - A standard that identifies a "profile" for electronic documents that ensures the documents can be reproduced the exact same way in years to come. A key element to this reproducibility is the requirement for PDF/A documents to be 100% self-contained. All of the

information necessary for displaying the document in the same manner every time is embedded in the file. This includes, but is not limited to, all content (text, raster images and vector graphics), fonts, and color information. A PDF/A document is not permitted to be reliant on information from external sources (e.g. font programs and hyperlinks).

D. Materials / equipment

1. File Transfer Media

a. The current file transfer medium is a waterproof USB solid state drive (SSD) also known as a flash drive. Alternative file transfer media may be used, at the discretion of DEP.

2. The USB SSD used for producing the electronic Archives shall be:

a. Corsair Flash Survivor USB 3.0 with 256 gigabytes storage

b. Or approved equal.

E. Source of Electronic Records

In preparing the electronic records, the Contractor shall make every reasonable effort to obtain from the originator (e.g., the manufacturer) documents in their original electronic format and incorporate these in the Final Record Documents. Subject to the approval of the Engineer, electronic records may be scanned from a paper version only when the Contractor cannot obtain the electronic version from the originator.

F. Metadata

1. For each type of Final Record Document, a Metadata table shall be prepared in Microsoft Excel which will furnish the specified data for that document. The data elements shall be furnished to the Contractor by DEP prior to production of the Final Record Documents USB SSD.

2. The Metadata Excel tables shall be utilized as the Final Record Document Log. Templates for the Metadata Excel table for each Final Record Document will be provided by the DEP.

3. The Metadata Excel Table shall be included in the USB SSD of each Final Record Document type and shall serve as an index for the files of the record in the USB SSD. Each file indexed in the Metadata Table shall be hyperlinked so that clicking on the file name opens that file. The filenames given on the Metadata Table must exactly match the files on the USB SSD to which they are hyperlinked.

4. A sample Metadata Excel table will be provided by DEP.

G. File Compression, File Formats, And Quality Control

1. File compression is not permitted for any of the files in any format.

2. File formats acceptable to DEP are ISO 19005-1 Portable Document Format-Archival (PDF/A); Tagged Image File Format (TIFF), version 6.0 (“II” format); AutoCAD and Revit. All files shall be delivered to DEP with file names that use the default file extension for each of the above formats.

3. Portable Document Format-Archival (PDF/A)

a. Security Settings: Records converted to PDF/A must have all security settings deactivated (e.g., encryption, master passwords, and/or permissions) prior to transfer to DEP. Deactivating security settings ensures DEP’s ability to support long term migration and preservation of the records.

b. Review of Special Features: Because of the complexities associated with certain PDF features, DEP will review PDF/A records containing special features on a case-by-case basis when the records are scheduled. Examples of special features include but are not limited to: digital signatures; links to other documents, files or sites; embedded files (including multimedia objects); form data; comments and/or annotations.

c. Fonts: Electronic records that have been converted to PDF/A from their native electronic formats must have all fonts referenced in the record embedded within the PDF file to guarantee the visual reproduction of all text as created. This requirement is met by having, as a minimum, subsets of all referenced fonts embedded within the PDF/A file. All fonts embedded in PDF/A records must be publicly identified as legally embeddable (i.e., font license permits embedding) in a file for unlimited, universal viewing and printing.

d. Scanning Production Requirements: records converted from scanned images also must adhere to the production requirements described herein.

H. Tagged Image File Format ("TIFF")

1. In the "II" format (i.e., *little-endian*), byte order is always from the least significant byte to the most significant byte.

I. Vector Drawings

1. Each vector drawing produced by Computer-Assisted Design (CAD) system shall be delivered to DEP in two different file formats: Native AutoCAD or Revit; and PDF/A.

2. Drawings will be “bound” to include all related matter, such as base files, font files, and shapes. Each file shall be viewable and printable, in its entirety, without recourse to external matter.

J. Text Files

1. The file format for all text files, whether converted from office automation systems or scanned, is PDF/A

2. The quality of documents to be scanned shall be governed by ANSI/AIIM MS52 "Recommended Practice for the Requirements and Characteristics of Original Documents Intended for Optical Scanning"

3. Quality Control in the scanning process shall follow the practices established in ANSI/AIIM MS44 “Recommended Practice for Quality Control of Image Scanning” and ANSI/AIIM TR34 “Sampling Procedures for Inspection by Attributes of Images in Electronic Image Management and Micrographic Systems”. The sampling rates for each type of Quality Control (visual and printed) shall be established by written agreement with DEP. The Subcontractor producing Final Record Documents shall supply a description of the Quality Control inspection performed as part of the scanning process and a report on the results of the last inspection performed on the images and the date of that inspection.

4. Documents shall be scanned using equipment and scanning parameters sufficient to ensure full reproduction of all significant detail in the documents, such as (but not limited to) curved lines and fill in drawings, color and tonal gradations in photographic images, the smallest printed text, handwritten notes, and signatures. Records may be scanned in bitonal (1-bit) mode and 300 pixels per inch (ppi) or better only when the records consist exclusively of clean printed type possessing high inherent contrast (e.g., laser printed or typeset on a white background). Records shall be scanned in gray scale (8- bit) and 300 ppi or better when the records consist of textual documents of poor legibility because of low inherent contrast, staining or fading (e.g., carbon copies, thermofax, or documents with handwritten annotations or other markings), or that contain halftone illustrations or photographs. Records shall be scanned in color (24-bit RGB) and 300 ppi or better when the records contain color information important to interpretation or content.

I. Digital Photographs

1. The file format for digital photographs is TIFF.

2. Photographic (raster) images shall be produced directly by digital cameras.

3. Digital cameras shall produce records with true optical resolution. Images shall not be resized or interpolated to a higher resolution from a lower resolution.

4. Photographic images shall be provided as continuous-tone (8-bit) gray scale or color (24-bit or 48-bit RGB) raster images.

5. Digital camera files shall be captured as specified in Section 01 32 30 - Job Photographs and Videos.

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EXHIBIT A

USB SSD Folder Structure

The USB SSD shall have a folder structure similar to the ones shown below.

For a USB SSD with one set of Final Record Documents

" Contract # – Bid Drawings (PDF Files)

Metadata Table- Contract # – As-Built Drawings - PDF.xls"

For a USB SSD with more than one set of Final Record Documents:

" Contract # – Bid Drawings (PDF)

" Contract # – Bid Drawings (PDF Files)

Metadata Table- Contract ### – As-Built Drawings - PDF.xls"

" Contract # – Bid Drawings (AutoCAD or Revit)

Contract # – Bid Drawings (AutoCAD or Revit Files)

Metadata Table- Contract # – As-Built Drawings - AutoCAD.xls or Revit.xls"

END OF SECTION

CONTRACT GI-CONS-7
SECTION 02 21 00
SITE SURVEYS

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall engage the services of a third-party New York State licensed surveyor as approved by the Engineer and reporting directly to the Engineer to make such surveys, cross sections or other measurements as directed by the Engineer.

B. Lines and grades

1. All Work shall be constructed according to the lines and grades shown on the Contract Drawings and as approved by the Engineer.

2. The Contractor will establish a baseline and benchmark to be approved by the Engineer.

3. The Contractor shall establish all other lines, elevations and grades required for the Work and be solely responsible for the accuracy thereof.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 11 00 – Summary of Work

B. Section 01 33 00 – Submittal Procedures.

C. Section 01 78 39 – Final Record Documents

1.03 PAYMENT

A. The price bid shall be a unit price for each SURVEY CREW DAY. One day shall consist of any eight (8) hour time period from 7:00 AM to 6:00 PM Monday through Friday plus travel time, not including holidays. The per day rate shall include the services of a three-man surveying crew. The total bid per diem cost for the services performed by the Licensed Surveyor, include all necessary equipment, including vehicles for the surveyors.

The quantity to be measured for payment under this section shall be the total number days the survey team is on Site in accordance with the plans and Specifications, as directed by the Engineer.

The Engineer shall be present during the progress of Work. The surveyor will submit invoices to the Contractor for prompt payment. Payments shall be made for invoiced costs only, with no payment for overhead or profit.

No payment shall be made for survey work required by the Contractor to complete normal operations, including but not limited to the layout of green infrastructure practices, quantifying cut or fill operations, completion of shop drawings, and development of as-built drawings.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall provide signed and sealed plans and documents, as required by the Engineer.

B. In accordance with the requirements of the Section 01 78 39 – Project Record Documents, the Contractor shall survey the On-Site GI Practices at the completion of construction and provide plans of the installation that demonstrate the final constructed location as part of the as-built conditions.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 FIELD WORK

A. The Engineer shall be notified prior to the establishment of any line, elevation or grade. Unless otherwise stated, the Contractor must provide personnel and instruments for determining alignment, elevation, and position for all construction between such points, subject to the check and correction of the Engineer. The Contractor shall provide, at its own expense, stakes and such other material as required by the Engineer for staking out the Work. Any change in the stakes and marks caused by the development of construction shall not be made the basis of claims for payment other than as provided for in this Contract.

B. PRESERVATION OF LANDMARKS: The Contractor shall safeguard all points, stakes, grade marks, monuments and benchmarks made or established on the Work, re-establish same if disturbed and bear the entire expense of rectifying Work improperly installed due to not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.

C. NONDISTURBANCE OF MONUMENTS: Except upon the express written permission from the President of the Borough in which the project is located or other governmental agency concerned, the Contractor shall not excavate within five (5) feet of or otherwise disturb any monuments, bolts or bench marks belonging to the City or any other government agency as may exist within the Site. Should the Contractor encounter such

monuments in the course of the Work, it shall cease its Work at such locations until the monuments have been referenced, reset or otherwise disposed of to the satisfaction of the Engineer.

D. Datum

1. Use North America Vertical Datum of 1988 ("NAVD 88") for vertical data.

2. Use North American Datum ("NAD 83") State Plane New York, Long Island FIPS 3104 Feet for horizontal data.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 02 24 20
SOIL SAMPLING AND ANALYSIS

PART 1 GENERAL

1.01 SUMMARY

A. The Contractor shall provide all labor, materials, tools, and equipment to perform all operations necessary to characterize, classify and determine the requirements for handling, reuse and disposal of all materials to be excavated.

B. The primary method of characterizing soils shall be through in-situ sampling. No stockpiling of excavated material on-site or ex-situ sampling will be allowed without written approval from the Engineer.

C. The following index of this Section is presented for convenience:

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1.02 PAYMENT

A. No separate payment shall be made for performing any Work required under this Section. All costs for Work required by this Section shall be included in the applicable lump sum, unit price(s) or allowance(s) as set forth in Section 01 27 00 – Measurement and Payment.

CONTRACT GI-CONS-7
SECTION 02 24 20
SOIL SAMPLING AND ANALYSIS

1.03 RELATED SECTIONS

A. Section 01 35 27 - Environmental, Health and Safety Requirements

B. Section 01 74 20 - Construction Waste Management

C. Section 31 23 16- Excavation

1.04 REFERENCES

A. Definitions

1. Analyte-free Water: Water containing less than the detection limits for volatile organics, pesticides, PCBs and inorganics. Compliance shall be verified either by the supplier or by an analytical laboratory.

2. Case-Specific Beneficial Use Determination (BUD): Under 6 NYCRR Part 360, Section 360.12(d), NYSDEC sets forth the requirements for petitioning NYSDEC to obtain a Case-Specific BUD, and the criteria for reviewing, granting, or denying of the BUD. For reuse of a solid waste to be determined a beneficial use, the petition must satisfy all criteria outlined under 6 NYCRR Part 360, Section 360.12(d).

3. Composite Sample: Composite sampling is comprised of grab samples which are initially collected from within a grid area and then combined into a single sample. This sample is representative of the entire grid area from which the grab samples were collected.

4. Excavated Material: All material regardless of its nature, except rock or boulders that have been excavated. Refer to Section 31 23 16 – Excavation.

5. Ex-situ Soil Sampling: Sampling of soil that has been excavated and stockpiled.

6. Fill: Soil and similar material excavated or brought to the Project Site for the purposes of construction. All fill material must meet the requirements of Section 31 23 23 – Fill. Fill from an off-site source shall be non-hazardous.

7. Grab/Discrete Sample: A single sample is collected at a particular time and place that represents the composition of the soil only at that time and place.

8. In-situ Soil Sampling: Sampling of soil prior to excavation and most representative of undisturbed conditions.

9. New York City Metropolitan Area Waste Impact Zone: The area encompassing the City of New York and the counties of Nassau, Suffolk, Putnam and Westchester, as per 6 NYCRR Part 360.2 Definitions.

10. Pre-Determined Beneficial Use for fill material: Under 6 NYCRR Part 360, Section 360.13(b) Waste cessation. “Excavated material ceases to be solid waste in accordance with the following:

a. Fill Type 1 generated outside of the New York City Metropolitan Area Waste Impact Zone (NYCMAWIZ) – once a determination has been made that the material is Fill Type 1;

b. Fill Type 1 generated within Nassau, Suffolk, Westchester and Putnam Counties – once the material is delivered to the site of reuse;

c. Fill Type 1 cannot be generated within the City of New York;

d. Fill Type 2 and Fill Type 3 generated outside of the NYCMAWIZ – once a determination has been made that the material is Fill Type 2 or Fill Type 3;

e. Fill Type 2 and Fill Type 3 generated within the NYCMAWIZ – once the material is delivered to the site of reuse;

f. Fill Type 4 and Fill Type 5 – Once the material is delivered to the site of reuse."

g. Under 6 NYCRR Part 360, Section 360.12(c)(1)(iv)(a), "Excavated material used to backfill the same excavation or as grade adjustment in areas of similar physical characteristics on the site of generation. If the material exhibits visual or historical evidence of contamination (including odors) and will be used in an area with public access, the material must be covered with pavement, foundation, or with a minimum of 12 inches of soil or fill that meets the criteria to be used as Fill Type 1 and Fill Type 2" as defined in Subdivision 360.13, Special requirements for pre-determined beneficial use of fill material.

11. Qualified Environmental Professional (QEP): "a person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding the presence of releases or threatened releases to the surface or subsurface of a property or off-site areas, sufficient to meet the objectives and performance factors for the areas of practice identified" in 6 NYCRR Part 360.The QEP must:

a. Hold a current professional engineer's or a professional geologist's license or registration issued by the State or another state, and have the equivalent of three years of full-time relevant experience; or

b. Be a site remediation professional licensed or certified by the Federal government, a state or a recognized accrediting agency, to perform investigation or remediation tasks consistent with department guidance, and have the equivalent of three years of full-time relevant experience. Examples include:

i. Licensed Site Professional, by the State of Massachusetts;
ii. Licensed Environmental Professional, by the State of Connecticut;
iii. Licensed Site Remediation Professional, by the State of New Jersey;
iv. Qualified Environmental Professional by the Institute of Professional Environmental Practice (now the Board of Certified Safety Professionals); or
v. Certified Hazardous Materials Manager, by the Institute of Hazardous Materials Management.

An Environmental Professional (EP) as defined in Section 01 35 27 – Environmental, Health and Safety Requirements may meet the requirements of a QEP.

12. Treatment, Storage, Disposal Facilities (TSDF): Includes, but is not limited to, all permitted facilities that treat, store, or manage disposal of regulated waste.

13. Waste Classification:

a. Regulated Solid Waste:

1) Construction and Demolition (C&D) Debris: Waste resulting from the construction, remodeling, repair and demolition of structures, buildings and roads. Such waste includes fill material, demolition wastes, and construction wastes. Materials that are not C&D debris (even if generated from construction, remodeling, repair, and demolition activities) include municipal solid waste, friable asbestos-containing waste, corrugated container board, electrical fixtures containing hazardous liquids such as fluorescent light ballasts or transformers, fluorescent lights, furniture, appliances, tires, drums, fuel tanks, containers greater than 10 gallons in size, and any containers having more than one inch of residue remaining on the bottom.

2) Hazardous Solid Waste: Material shall be considered a characteristic hazardous solid waste when it exhibits any of the following: ignitability, corrosivity, reactivity, or toxicity for Volatile Organic Compounds (VOCs), semi-VOCs (SVOCs), metals, pesticides, or herbicides, as defined in 6 NYCRR Part 371 or 40 CFR Section 261. Under New York State (NYS) regulations, a material that contains 50 ppm or greater of PCBs is considered a hazardous waste. The Environmental Protection Agency (EPA) considers a material that contains 50 ppm or greater of PCBs to be a Toxic Substances Control Act (TSCA)-regulated waste. All

hazardous waste shall be considered unsuitable for reuse, and shall be disposed of at an approved permitted hazardous waste landfill.

3) Non-Hazardous Contaminated Waste: Non-hazardous contaminated waste includes soil commingled with or containing other waste, petroleum and petroleum products, except those present solely as a result of normal use of vehicles on roadways or parking areas, and pesticides except those present solely as a result of the proper application in normal agricultural or horticultural practices. Physical evidence that soil is contaminated shall include visual identification of waste, chemical odors, vapor emission, and chemical staining.

4) Non-hazardous Petroleum-contaminated Waste: Exhibits a discernible petroleum-type odor, contains visible petroleum product, or may be associated with a reported spill.

b. Non-regulated Solid Waste: This applies to materials that, before being beneficially used (as determined by the NYSDEC or applicable out-of-state regulatory agency) were solid waste. Material used as described in 6 NYCRR Part 360, specifically Section 360.12(c) and Section 360.12(d) is no longer considered solid waste.

B. Reference Standards

1. EPA QA/G-4, Guidance on Systematic Planning Using the Data Quality Objectives Process, February 2006 or latest revision

2. USEPA Office of Solid Waste, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (SW-846), Third Edition, December 1996 with updates or latest revision

3. USEPA 40 CFR Chapter I, Subchapter R, - Toxic Substance Control Act (TSCA), Part 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

4. NYSDEC regulations, 6 NYCRR Part 360, Solid Waste Management Facilities General Requirements

5. NYSDEC regulations, 6 NYCRR Part 371, Identification and Listing of Hazardous Wastes (40 CFR Part 261)

6. NYSDEC regulations, 6 NYCRR Part 375, Environmental Remediation Programs

7. American Society for Testing and Materials (ASTM) Standards:

a. D422 - Method for Particle-Size Analysis of Soils.

b. D1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

c. D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))

d. D6938 - Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.05 DESCRIPTION

A. Sampling Requirements

1. Fill Material:

a. Material to be excavated and proposed for reuse as fill under a Pre-Determined Beneficial Use must meet the requirements of 6 NYCRR Part 360, Section 360.13(a), Applicability, Section 360.13(b), Waste Cessation, or Section 360.12(c)(1)(iv)(a). If these criteria cannot be met, such material must meet Section 360.12(d), Case-specific beneficial use determinations - general.

b. Under 6 NYCRR Part 360, Section 360.13, soil may be determined by the Contractor's QEP to be suitable for reuse onsite, without sampling, if any of the following criteria can be satisfied:

1) Excavated material originates from a location outside of the City of New York with no evidence of historical contamination based on site use, reported spill events, or visual and other indications (odors, etc.) of chemical or physical contamination discovered prior to excavation, or that no visual indication of chemical or physical contamination is discovered during excavation, as referenced in Part 360.13(d)(2).

2) "Fill material originates from a location within the City of New York unless the quantity of fill material does not exceed ten cubic yards from one site and the ten cubic yards or less of material does not exhibit historical evidence of contamination based on site use, reported spill events, or visual or other indicators (odors, etc.) of chemical or physical contamination" as referenced in Part 360.13(d)(1).

3) Excavated material used to backfill the same excavation or as grade adjustment in areas of similar physical characteristics on the site of generation under 6 NYCRR Part 360, Section 360.12(c)(1)(iv)(a).

c. Sampling, pursuant to 6 NYCRR Part 360, Section 360.13(d), is required when the above criteria cannot be met as determined by the Contractor's QEP. Fill material samples shall be analyzed for, at a

minimum, metals, PCBs/pesticides, and SVOCs as listed in 6 NYCRR Part 375, Subdivision 375-6.8(b) per 6 NYCRR Part 360.13(e)(2)(i) In addition, and only if site conditions warrant, fill material shall also be analyzed for additional parameters as referenced in Part 360.13(e)(2)(ii-iv).

d. Sampling is performed within the planned excavation boundaries at frequencies as defined in 6 NYCRR Part 360, Section 360.13(e)(1), Table 1: Minimum Analysis Frequency for Fill, unless otherwise required by the beneficial use facility / treatment, storage, and disposal facility (TSDF).

e. Analytical data is used to determine acceptable fill material uses (Fill Types 1, 2, 3, 4 and 5), as defined in 6 NYCRR Part 360, Section 360.13(f), Table 2: Fill BeneficialUse.

https://extapps.dec.ny.gov/docs/materials_minerals_pdf/budfillnotify.pdf

f. If it is determined by the Contractor's QEP during construction that soils cannot be reused in New York State, additional sampling shall be performed to meet the out-of-state beneficial use facility / TSDF requirements.

g. When sampling is necessary for offsite, out-of-state reuse or disposal, excess soils shall be sampled for asbestos, SVOCs, VOCs, and pesticides and herbicides, in addition to any other parameters required by the reuse/disposal facility. Frequency of sampling shall be as required by the out-of-state reuse/disposal facility.

2. When relocating soils on the same site, hazardous soils, non-soil wastes, or hot spots, as evidenced by visual observation, hand-held instruments or analytical results, must not be incorporated. All such material shall be removed for disposal off-site.

B. Off-Site Beneficial Use Facility / TSDF

1. The Contractor shall submit the information listed below of the selected off-site soil beneficial use facilities / TSDFs and their location(s) to the Engineer for approval as part of the Soil Excavation, Treatment Reuse, and Disposal Plan specified in Section 31 23 16 – Excavation.

a) Name and address of the disposal facility
b) Name and address of contact personnel at disposal facility
c) Permits, including the permit status, types of materials accepted, specific analytical testing parameters and frequency that must be performed for each material that the permit requires
d) Any additional analytical testing parameters and frequency that must be performed for each material required by the disposal facility not specified in the permit

e) Facility's waste acceptance criteria for each material

2. Reuse of excavation spoils off-site must be prioritized over disposal. TSDFs shall only be approved where reuse options are not available.

3. Note that some companies may have multiple beneficial use facilities or TSDFs, each possessing differing requirements regarding the types of materials accepted, the specific analytical testing parameters that must be performed for each material, and the frequency of sampling required for each material. It is the Contractor's responsibility to determine the types of materials accepted, specific waste acceptance criteria (analytical parameters) and frequency of testing requirements for each of its proposed facilities.

4. The Contractor shall confirm the location(s) and permit status, as well as check for outstanding violations and enforcement actions at each selected beneficial use facility / TSDF. The Engineer shall verify the information provided by the Contractor for each facility prior to approval.

5. If an approved facility is not available during construction, the Contractor shall be fully responsible for procuring alternate approved facilities at no additional cost to the City. Any additional sampling and analysis required and labor involved in selecting new facilities after the initial reuse or disposal facilities are accepted shall be the responsibility of the Contractor.

C. Project Conditions

1. Stockpiling: No stockpiling of excavated material on-site or ex-situ sampling of excavated soils will be allowed without written approval from the Engineer. Soils stockpiled for onsite reuse do not require sampling if they meet the conditions in Article 1.05.A.1.b.

   a. If stockpiling is considered necessary, and approved by the Engineer, sampling shall be conducted by collecting representative grab samples throughout the soil stockpile. Surface soil shall not be used as sampling material. Sampling frequency and analytical requirements will at a minimum conform to the sampling requirements specified herein. Multiple samples shall be classified based on biased worst case to be considered fully representative of the soils being sampled for reuse in New York State. The Contractor is also required to satisfy the specific sampling requirements of the beneficial use facility or TSDF.

   b. During stockpiling activities, the Engineer may identify quantities within each 300 cubic yard portion that differ in appearance from the bulk of the material as per 6 NYCRR Part 360, Section 360.13(e)(1) Table 1. In this case, the Engineer will direct the Contractor to segregate these variable materials for separate

stockpiling on-site. The Contractor shall sample each stockpile that differs in appearance from the bulk of the material.

c. All stockpiles of excavated materials shall be managed on site as required in Section 31 25 10 – Dust, Soil Erosion and Sedimentation Control.

2. Decontamination of Sampling Equipment: All sampling equipment shall be certified clean or precleaned, prior to collection of each sample, by the following method:

a. Wash all sampling equipment, secondary containers (e.g., mixing bowls for composite sampling) and aluminum foil with non-phosphate laboratory grade detergent and distilled water.

b. Triple rinse with distilled water.

c. Rinse with isopropyl alcohol, or if samples are visibly contaminated with petroleum use a solvent, such as hexane or other alternate approved by the Engineer.

d. Triple rinse with analyte-free water.

3. Disposal of Decontamination Solutions: Collect all decontamination solution and dispose of it through a licensed chemical waste disposal service following the applicable State and local permits.

1.06 QUALITY ASSURANCE

A. Laboratory Requirements:

1. The Contractor shall provide the services of a laboratory certified by the New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) to perform applicable testing and chemical analyses for the duration of the Work.

2. The laboratory shall also meet the certification requirements of the beneficial use facility / TSDF that will be utilized by the Contractor for the duration of the Work.

B. Permits and Regulations:

1. The Contractor shall obtain all necessary permits and perform all work in compliance with applicable requirements of OSHA, and other governing authorities having jurisdiction including all federal, state and local governing authorities.

C. Field QA/QC Samples:

1. Shall be collected and analyzed in accordance with the protocol for site samples.

2. The number of QA/QC samples required for a quantity of soil shall meet all beneficial use facility / TSDF requirements, and the approval of the Engineer.

Minimum Analysis Frequency for Fill		
Fill Quantity (cubic yards)	Minimum Number of Analyses for Volatile Organic Compounds, if Required	Minimum Number of Analyses for all other parameters
0-300	2	1
301-1000	4	2
1001-10,000	6	3
10,001+	Two for every additional 10,000 cubic yards or fraction thereof	One per every additional 10,000 cubic yards or fraction thereof

D. Sample Turn-Around: The Contractor shall provide for prompt sampling and turn-around of analysis so as not to delay the project. If a turn-around time of less than ten (10) business days is required due to delays in construction scheduling or other constraints, Contractor shall provide for such at no additional cost to the City.

1.07 SUBMITTALS

A. The Contractor shall submit Shop Drawings and other materials, including, but not limited to, those listed below for the approval of the Engineer. Where the Contractor's QEP determines that no sampling is required, at a minimum a Field Sampling Plan (FSP) per Article 1.07.A.2 shall be submitted describing a procedure for encountering potentially contaminated material during excavation as described in 1.05.A.2.

1. DEP Environmental, Health, and Safety (EHS) Drilling and Boring Checklist: The Contractor shall work with the Engineer to complete all necessary portions of the EHS Drilling and Boring Checklist. This shall be completed and submitted to the Engineer a minimum of 60 days prior to the proposed commencement of the drilling/boring work. No drilling/boring work shall be performed at the Site without completion and written approval of the EHS Drilling and Boring Checklist from the Engineer. Updates to the checklist shall be completed and submitted whenever there is a change of the drilling subcontractor or scope of drilling/boring work; or new EHS hazards have to be considered in performing the work.

2. Field Sampling Plan (FSP): A FSP, prepared by the Contractor's QEP, shall be submitted to the Engineer for approval 30 days following notice to

proceed. The Engineer will approve the FSP only if it clearly provides a means to collect the information necessary to allow for classification of all material proposed for excavation and if it will ultimately generate data necessary for on-site reuse as per 6 NYCRR Part 360, Section 360.13, or Section 360.12, or to gain approval from the Contractor's chosen off-site beneficial use facility / TSDF. No sampling shall be conducted until the Engineer has reviewed and formally approved the FSP in writing. The FSP shall include the following at a minimum:

a. Locations and protocols for the collection and analysis of samples that represent all soils to be excavated. Collection methods and chosen locations shall be sufficient to pre-characterize the soil prior to excavation unless post-excavation sampling is approved by the DEP.

b. Each composite sample will be comprised of multiple (3-5) discrete samples that are representative of the horizontal and vertical extent of the excavation footprint.

    1) When VOC analysis is required, two (2) discrete (biased worst case) VOC samples will be collected for every one (1) composite sample.

    2) When soils are visibly heterogenous, composite and discrete (for VOCs), samples will be obtained to represent each visually different stratum or section of the excavation site, regardless of the overall excavation volume.

c. A detailed outline of the BUD or beneficial use facility / TSDF requirements for sampling, testing and analysis including specific number and types of samples per unit volume of soil to be excavated.

d. Parameters analyzed for soils to be reused or disposed, as defined in 6 NYCRR Part 360, Section 360.13 (e), in addition to any other parameters required by the beneficial use facility / TSDF.

e. A scaled site map showing:

    1) existing fixed landmarks;

    2) proposed excavation limits or area to be excavated divided into distinct vertical and horizontal grids, identifying the volume of soil or fill that each sample will represent;

    3) specific sampling locations that are representative of the entire depth of excavation and that will conform to the applicable sampling frequency requirement;

    4) identification numbers of the sample grids, relative depth, sampling intervals, and volumes reflective of the Contractor's excavation method.

a) Sampling intervals shall account for existing subsurface data, historic sampling information, including descriptions, depths, orientation, and location of material of potentially different classifications, and shall minimize undue mixing of excavated soils.

f. Proposed sampling, handling, preservation, and storage of equipment procedures, including transfer procedures, and sampling equipment decontamination procedures.

g. Proposed analytical methods, in accordance with SW-846, latest edition, for the analyses to be performed. Contractor shall confirm the analytical method and laboratory selected is accepted/certified by the receiving facility, including beneficial use facility/TSDF, meets the regulatory requirements, and can meet the required reporting limits for comparison to beneficial use facility/TSDF accepting criteria and other limits, as applicable.

h. Procedures for assessing precision, accuracy, degree of representation, comparability and completeness of samples and data, including performance audits and proposed protocols for corrective measures where problems are identified in accordance with Article 1.06 -- Quality Assurance.

i. Schedule of field inspections.

j. A statement that the sampling program is in accordance with the Contract requirements.

k. Manufacturer, catalog data and calibration records of all analytical equipment to be used on-site.

l. Name and address of analytical laboratory, copy of laboratory certification, and Quality Assurance Manual.

m. Description of field and laboratory QA/QC samples and any additional requirements of the reuse or disposal facilities.

n. The organizational structure of the Contractor's and all subcontractors' quality management (QM) personnel, including:

1) names, titles and contact information;

2) resumes;

3) responsibilities;

4) authorities; and

5) qualifications.

3. Field Sampling Summary Report (FSSR): A FSSR, prepared by the Contractor's QEP, shall be submitted to the Engineer for review in a timeframe, dependent on the extent of the data collection effort, determined by the Engineer at the time. Contractor shall be solely responsible for ensuring that the FSSR meets all requirements of Contractor's proposed beneficial use facility/TSDF. The FSSR shall contain all laboratory analytical results obtained from the field sampling event and shall allow the Engineer to determine if the soil is acceptable for beneficial use or requires disposal at a permitted TSDF. At minimum, the FSSR shall include the following information:

   a. A detailed account of any field procedures used which deviated from or were in addition to those established in the FSP.

   b. A summary table listing the analytical results (with individual ID for each sample) with highlighted exceedances of 6 NYCRR Part 360, Section 360.13 (f), Table 2: Fill Material Beneficial Use, all Beneficial Use Facility/TSDF acceptance criteria, RCRA characteristics, and any other screening criteria identified and approved by the Engineer during the Project, as applicable.

   c. Location of each sampling point (using individual ID from analytical results summary table) on the scaled site map created in the FSP.

   d. A complete set of field notes collected and maintained by the Contractor during sampling. The field notes shall be made available to the Engineer during the sampling program.

   e. Boring or probe logs from each sampling location containing a continuous stratigraphic description of all material encountered. Descriptions of material shall include, but not be limited to, color, odor, staining, field screening measurement, relative grain size distribution, material composition, moisture content, and cohesive properties.

   f. Depth intervals for each sample, whether a grab or composite, and any special notes, which are included on the laboratory chain-of-custody forms.

   g. Copies of all laboratory chain-of-custody forms for samples that are collected for analysis.

   h. Analytical Results: The Contractor shall submit analytical results for sampled soil material to the Engineer within three (3) business days of receiving such data from the laboratory. Analytical results data shall be managed by utilizing a computer spreadsheet or database program compatible with NYSDEC requirements for EQuIS submittals as approved by the Engineer. Data shall be organized in

such a way that all samples may be tracked from collection through analysis.

1) The analytical results generated for a ten (10) business day turn-around time deliverable shall include a Form I (or equivalent) showing compounds analyzed for, and concentrations detected, and associated chain-of-custody reports to the Engineer.

2) The final data package generated by the laboratory shall include the following information:

   a) A Form I showing pertinent physical data presented in concise, easy to follow formats (i.e., sample number, laboratory ID, client, date of sample preparation, date analyzed, percent moisture, dilution factor, sample matrix, units, undetected and detected compounds, etc.).

   b) Reference to analytical methodology used.

   c) General discussion including a description of sample types, tests performed, any problems encountered, and any general comments (case narrative).

   d) Data from each discrete sample reported using cross-referencing between site samples and quality control samples and including all pertinent dates, information and reporting limits.

   e) Associated quality control samples such as blanks, spikes and spike duplicates, laboratory duplicates, laboratory control samples, field duplicates and appropriate check standards.

   f) Copies of chain-of-custody sheets.

3) The information must be delivered on CD or via electronic mail to the Engineer. All electronic data must be certified to be virus-free.

B. Monthly Submittals: Monthly soil generation/diversion (onsite and offsite reuse)/disposal data shall be tracked in accordance with Section 01 35 27 – Environmental Health and Safety Requirements and 01 74 20 – Construction Waste Management.

C. Coordinate all submittals with the Soil Excavation, Reuse, Transport and Disposal Plan (SERTD Plan) required in Section 31 23 16 – Excavation.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Sample Identification:

1. All samples shall be identified with a sample label in addition to an entry on a chain-of-custody record. The label shall be identified upon receipt by the laboratory and cross-referenced to the chain-of-custody record.
2. Any inconsistencies shall be noted on the custody record. Laboratory personnel shall notify the Sampling and Analysis Manager immediately if any inconsistencies exist in the paper work associated with the samples, and Contractor shall collect new samples to replace those with inconsistencies which cannot be rectified.

B. Sample Labels: The field team shall complete the following information on a sample label for each sample bottle:

1. Site Name
2. Job Number
3. Sample Number
4. Sample Description
5. Company Name
6. Parameters to be analyzed
7. Date
8. Time
9. Preservation Technique Employed
10. Sample labels shall be attached to the sample bottles

C. Completion of Chain-of-Custody Record:

1. Maintain a chain-of-custody record on all samples. A chain-of-custody record is a printed multi-part form that accompanies a sample or group of samples as custody is transferred from person to person. A chain-of-custody record is a controlled document.
2. As soon as is practical after sample collection, preferably after decontamination, the following information shall be entered on the chain-of-custody form. All information shall be recorded in ink.
    a. Project number: Enter the alphanumeric designation assigned by the field team that uniquely identifies the project site.
    b. Project name: Enter the site name.
    c. Samplers: Sign the name(s) of the sampler(s).
    d. Station number: Enter the sample number for each sample in the shipment. This number appears on the sample identification label.
    e. Date: Enter a six-digit number indicating the year, month, and day of sample collection.

f. Time: Enter a four-digit number indicating the time of collection in 24-hour time, for example, 13:54.

g. Matrix/Type: Indicate the type of sample; composite or grab.

h. Station location: Describe the location where the sample was collected.

i. Number of containers: For each sample number, enter the number of sample bottles that are contained in the shipment.

j. Remarks: Enter any appropriate remarks.

k. Sample Shipment:

3. Custody of samples shall be maintained throughout the shipment of samples to the selected laboratory (ies). All samples shall be packaged and shipped daily to ensure that no sample is held at the site more than 24 hours. Samples shall be delivered directly to the laboratory using the following procedures:

a. Use waterproof high-strength plastic ice chests or coolers only.

b. After filling out the pertinent information on the sample label and tag, put the sample in the bottle or vial and screw on the lid. For bottles other than VOC sample bottles, secure the lid with tape (tape on VOC bottles may cause contamination).

c. Place inert cushioning material such as vermiculite or "bubble-wrap" in the bottom of the cooler.

d. Enclose the bottles in clear plastic bags through which sample labels are visible, and seal the bag. Place bottles upright in the cooler in such a way that they do not touch and will not touch during shipment.

e. Put in additional inert packing material to partially cover sample bottles (more than half-way). Place double-bagged crushed ice around, among, and on top of the sample bottles.

f. Fill cooler with cushioning material.

g. Put paperwork (chain-of-custody record) in a waterproof plastic bag and tape it with packing tape to the inside lid of the cooler.

h. Tape the drain shut.

i. Secure lid by taping. Wrap the cooler completely with strapping tape at a minimum of two locations. Do not cover any labels.

j. Attach completed shipping label to top of the cooler.

k. Put "This Side Up" labels on all four sides and "Fragile" labels on at least two sides of coolers containing glass containers.

l. Ship the cooler overnight by commercial carrier (e.g., Federal Express, UPS), laboratory carrier or field personnel to the respective laboratory.

m. Custody forms for the samples shall be signed by the Contractor's designated representative who is relinquishing custody. The custody form shall include the air bill number, method of shipment, and time and date of the transfer of custody.

4. Custody seals shall be applied to the front and back of the sample coolers. A shipping label with return address shall be applied as well as the air express bill and any Department of Transportation (DOT) required labels or markings.

D. Transferring Custody of Samples to Shipper, if applicable: Contractor shall transfer custody of samples to a shipper as follows:

1. Sign, date, and enter time on the chain-of-custody report under "Relinquished by."

2. Make certain that shipper signs the "Received by" entry.

3. Enter name of the carrier under next "Relinquished by" category. Receiving laboratory shall sign "Received for Laboratory by" on lower line and enter date and time.

E. Transferring Custody from Sampler or Shipper to Common Carrier:

1. The shipper or Contractor shall transfer custody of samples to a common carrier as follows:

a. Sign, date, and enter time under "Relinquished by" entry.

b. Enter name of carrier (e.g., UPS, Federal Express) under "Received by."

c. Enter bill-of-lading or Federal Express airbill number under "Remarks."

d. Place the original of the chain-of-custody form in the appropriate sample shipping package. Retain a copy with field records.

e. Sign and date the custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field.

f. Wrap the seal across filament tape which has been wrapped around the hinges of the shipping package at least twice.

g. Fold the custody seal over on itself so that it sticks together.

h. Complete other carrier-required shipping papers.

i. In instances when the Common Carrier will not accept responsibility for handling chain-of-custody forms, the Contractor shall ensure that the record is packed within the sample package.

F. Laboratory Custody Procedures: Once the samples arrive at the laboratory, the Contractor shall ensure that custody of the samples is maintained by laboratory personnel. The laboratory shall, at a minimum, document the chain of custody through each stage of analysis from receipt to final reporting.

1.09 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES

A. Not Used

1.10 WARRANTY

A. Not Used

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Not Used

2.02 MATERIALS / EQUIPMENT

A. Not Used

2.03 FABRICATION / ASSEMBLING / FINISHES

A. Not Used

2.04 SOURCE QUALITY CONTROL / SHOP TESTS

A. Not Used

PART 3 EXECUTION

3.01 EXAMINATION / PREPARATION

A. Testing shall be in accordance with the sampling requirements of Article 1.05.A.

1. Parameters analyzed for soils to be reused on-site per 6 NYCRR Part 360.13(e)(2), if the exemption for onsite reuse of soil does not apply or there are excess soils, shall include the following:

a. Total metals, Semi-volatile organic compounds (SVOCs), Volatile organic compounds (VOCs), and pesticides and herbicides;

b. RCRA characteristics, including metals, SVOCs, VOCs, and pesticides and herbicides;

c. Polychlorinated biphenyls (PCBs); and

d. Asbestos.

e. Volume of physical contaminants, if present;

2. Parameters analyzed for soils to be reused or disposed off-site shall be the RCRA characteristics, including metals, SVOCs, VOCs, and pesticides and herbicides, in addition to any other parameters required by the beneficial use facility or TSDF.

B. Field sampling shall be completed in ample time to prevent delay of the excavation work or the work of any other contractor.

3.02 IMPLEMENTATION

A. When relocating soils on the same Site, hazardous soils, non-soil wastes, or hot spots, as evidenced by visual observation, hand-held instruments or analytical results, must not be incorporated. All such material shall be removed off-site for proper disposal, treatment, and/or reuse as applicable.

3.03 FIELD TESTING / QUALITY CONTROL

A. Sampling frequencies shall be per Article 1.05.

B. Classification of soils for reuse or disposal shall be carried out by the Engineer.

C. Conduct testing in accordance with the approved FSP.

D. Calibrate all instruments in accordance with manufacturer recommendations.

3.04 STARTUP / DEMONSTRATION

A. Not Used

3.05 ADJUSTING / PROTECTION / CLEANUP

A. Not Used

END OF SECTION

CONTRACT GI-CONS-7
SECTION 02 24 20
SOIL SAMPLING AND ANALYSIS

NO TEXT ON THIS PAGE

CONTRACT GI-CONS-7
SECTION 02 26 00
HAZARDOUS MATERIAL ASSESSMENT

PART 1 GENERAL

1.01 REQUIREMENTS

A. This Section describes the requirements for the assessment of hazardous materials.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 35 27 - Environmental, Health and Safety Requirements

B. Section 01 33 00 - Submittal Procedures

C. Section 02 41 10 - Demolition and Removals

D. Section 02 24 20 - Soil Sampling and Analysis

E. Section 31 23 16 – Excavation

1.03 PAYMENT

A. Payment for all Work specified in this Section shall be made under Allowance Item A-1 Soil Sampling and Analyses, Unforeseen Hazardous Material Control and Handling, Transportation and Offsite Disposal of Hazardous Material.

1. Following receipt of initial soil sampling analysis results that indicate the potential presence of hazardous materials, payment for additional soil sampling and analysis required to further characterize excavated materials as hazardous waste and for purposes of disposal as well as additional sampling and analysis directed by the Engineer, will be paid under Allowance Item A-1.

2. Payment for disposal of unforeseen hazardous materials will not be made until a signed copy of the hazardous waste manifest from a Transportation, Storage and Disposal Facility (“TSDF”), RCRA Subtitle C landfill, or in the case of PCB remediation waste, a landfill approved to except such waste, certifying the amount of hazardous material received at the disposal facility is returned.

3. The costs of the hazardous waste tax and hazardous waste regulatory program fee will be reimbursed under General Allowance Item A-1, with no provision for overhead and profit.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE

CONTRACT GI-CONS-7
SECTION 02 26 00
HAZARDOUS MATERIAL ASSESSMENT

A. Hazardous Waste Contingency Plan and Hazardous Waste Minimization Plan

1. If the location of the project is on a Site which has an active Large Quantity Generator status, then the Contractor shall conform to the requirements of the Hazardous Waste Contingency Plan and Hazardous Waste Minimization Plan for that Site.

2. If the total hazardous waste generation of all contracts under this project or all projects on this Site changes the Site generator status to a Large Quantity Generator, as determined by DEP, the Engineer will direct the Contractor to prepare a Hazardous Waste Contingency Plan and a Hazardous Waste Minimization Plan under Allowance Item No. A-1.

B. Remediation Plan

1. Remediation Plans for unforeseen hazardous materials shall comply with all applicable requirements of federal, State, and local hazardous waste regulations and shall include, but not be limited to:

   a. Identification of characteristic hazardous wastes, listed hazardous wastes, PCB remediation wastes, and regulated/non-hazardous wastes associated with the Work.

   b. Estimated quantities of wastes to be generated and disposed of.

   c. Names and qualifications of each sub-contractor that will be testing, transporting, storing, and disposing of wastes. Include the facility location and a 24-hr phone contact number and applicable transporter and TSDF or RCRA Subtitle C landfill permits, EPA Identification Numbers, and insurance certificates.

   d. Names and qualifications (experience and training) of personnel who will be responsible for on Site management of hazardous wastes.

   e. Detailed description of the containment and removal procedures.

   f. List of waste handling equipment to be used in performing the Work, to include cleaning, volume reduction, and transport equipment.

   g. Spill prevention and cleanup contingency measures to be implemented.

   h. Work plan for waste management, on-Site storage, removal and disposal.

   i. Detailed schedule indicating the beginning and completion dates for each activity and each Work area, including time for clean-up, inspection, and monitoring activities.

   j. Procedures to be followed for required regulatory agency notifications, correspondence, and submittals.

C. Waste Management Records

1. Disposal of wastes generated by remediation Work will be based on the results of testing and shall be at a site permitted to accept such waste by the Environmental Protection Agency (EPA) or an authorized state or local government agency. The Contractor shall provide hazardous waste profiles for New York City Department of Parks and Recreation (NYC Parks) signature as generator, permit documentation required for the selected TSDF or RCRA Subtitle C landfill to receive these wastes, and the transporter's Part 364 Waste Transporter Permit(s) required to transport wastes to the disposal facility. The Contractor shall also provide advance copies of the hazardous waste manifest(s) for the Engineer's review and approval.

2. The Contractor shall submit written evidence that selected TSDF or RCRA Subtitle C landfill will accept or have accepted the wastes generated during remediation. The Contractor shall also submit copies of the completed manifest, signed and dated by the initial transporter, in accordance with Federal and State requirements and with associated documentation (e.g., Waste Profile and Hazardous Waste Land Disposal Restrictions ("LDR") Notification and Certification Form). Copies of completed and signed waste manifests from TSDFs or RCRA Subtitle C landfills shall be provided to the Engineer within seven (7) days of waste shipment offsite.

1.06 SUBMITTALS

A. Six (6) copies of the following items shall be submitted to the Engineer:

1. A Health and Safety Plan ("HASP") in accordance with DEP Standard Specifications for Green Infrastructure Section 00 73 19 – Health and Safety Requirements.

2. Coordination Plan for Known Hazardous Materials.

3. Remediation Plan for Unforeseen Hazardous Materials.

4. Proposals for remedial action work and evidence of disposal of hazardous and non-hazardous waste at an approved facility in accordance with the requirements of this section.

B. The Contractor, when requested by the Engineer, shall provide additional copies of all reports and related materials as may be needed for conferences with the Commissioner and other agencies having jurisdiction.

1.07 QUALITY CONTROL (NOT USED)

1.08 DEFINITIONS

A. A competent person is one who is capable of identifying existing and predictable hazards in the Work area or unsanitary, hazardous, or dangerous working conditions, and who has authority to take prompt corrective measures (29 CFR 1926.32(f)).

B. Large Quantity Generator - A facility that generates (in a calendar month) ≥1,000 kg of total hazardous waste or >1 kg of acute hazardous waste or >100 kg of acute hazardous waste spill residue or soil, or stores hazardous and acute hazardous wastes in greater quantities (at any time) than ≤6,000 kg of hazardous waste, ≤1 kg acute hazardous waste and ≤100 kg of acute hazardous waste spill residue or soil specified for an SQG.

C. Hazardous Materials – Per EPA any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (40 CFR 261). Hazardous wastes are a subset of hazardous materials.

D. Characteristic Hazardous Wastes – a solid waste exhibiting one or more of four characteristics determined through testing: ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004 – D043). See also New York State's definition of hazardous waste at 6 NYCRR Part 371(d).

E. Listed Hazardous Wastes – a waste that is listed as a hazardous waste. See also New York State's definition of hazardous waste at 6 NYCRR Part 371(d).

F. Toxicity Characteristic Leaching Procedure (TCLP) – a laboratory test using EPA Method 1311 to determine if a waste is a characteristic hazardous waste because of toxicity.

G. Polychlorinated Biphenyl (PCB) Remediation Waste – waste containing PCBs from an unauthorized disposal of PCBs such as a spill or release into soil. EPA regulates PCB remediation waste under the Toxic Substances Control Act (TSCA) 40 CFR Part 761 and New York State regulates waste containing PCBs under 6 NYCRR Part 371. Soil or concrete containing Total PCBs at a concentration exceeding 1 mg/kg is regulated pursuant to TSCA. PCB remediation waste containing Total PCB concentrations of 50 ppm or greater is considered hazardous waste in New York State. Management, handling, and disposal of PCB remediation waste shall comply with both 40 CFR Part 761 and 6 NYCRR Part 371.

1.09 KNOWN HAZARDOUS MATERIALS

A. There are no known hazardous materials under this Contract.

1.10 UNFORESEEN HAZARDOUS MATERIAL

A. The possibility also exists of encountering unforeseen hazardous materials at locations where their presence could not be ascertained prior to the performance of the Work. Due to this potential, an allowance item has been established for unforeseen hazardous materials. When this potential has been identified or an upgrade in health and safety protocol is necessary for unforeseen hazardous materials, the Engineer will direct the Contractor to engage the services of a Hazardous Materials Specialist to perform the

necessary investigation, develop the Remediation Plan, perform appropriate regulatory agency notification, and perform the remediation work. Additionally, the Engineer will direct the Contractor to update its Health and Safety Plan as necessary. The Contractor shall immediately inform the Resident Engineer when hazardous material is encountered.

B. The Contractor shall be responsible for identifying previously unknown and suspect hazardous materials as they are encountered. Indication of the presence of hazardous materials, such as odorous or stained soils, sediment or liquids, PCB containing materials, and asbestos containing materials must be immediately reported to the Engineer. All Work in the area shall stop until otherwise directed by the Engineer.

C. The Engineer shall direct the Contractor to obtain cost proposals for the Work, from up to three separate DEP approved certified Hazardous Material Specialists, and submit them in writing to the Engineer within ten (10) business days of receiving the scope of Work. The Engineer may select one proposal and direct the Contractor to engage the selected remediation Hazardous Material Specialist as a subcontractor. Remediation Work shall not commence until the Contractor receives written notice from the Engineer to proceed with the Work.

D. The Contractor shall not initiate or proceed with any Work in areas associated with potentially hazardous or hazardous materials until these materials have been removed from these areas or managed in accordance with applicable Federal, New York State and New York City regulations.

E. Some of the remediation Work may be critical to maintaining construction schedules. When this occurs, the Engineer will establish a time of completion.

1.11 HAZARDOUS WASTE TAX

A. The Contractor is responsible for hazardous materials remediation and may be directed to pay the New York State Department of Taxation and Finance for special assessments on hazardous waste generated at the project Site and/or the DEC regulatory program fees charged on the facility operating at the Site. When directed by the Engineer, the Contractor shall pay the amount indicated within 48 hours of such notification.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 02 30 00
TEST PITS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Contractor shall perform test pits to locate where buried utilities may conflict with proposed Green Infrastructure practices as shown in the Contract Documents, or as directed by the Engineer. Test pits may be performed only by individuals trained to perform, understand, and evaluate the field conditions, and conducted using means and methods that will avoid any adverse impact to the utility. All applicable Occupational Safety and Health Administration (OSHA) regulations related to earthwork and excavation must be adhered to.

B. Hand and pneumatic excavation is required for test pits associated with 48" BWSO water mains as shown on the Contract Drawings.

C. Backfill, compact, and restore the surface of the excavation to the satisfaction of DEP and the Engineer.

D. The Contractor shall repair damage to any structure, utility, or private or public property damaged during prosecution of this work, to the satisfaction of the utility/property owner.

E. The Contractor may, at his expense, perform additional test pit excavation not ordered by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 00 00 – Submittal Procedures

1.03 PAYMENT

A. Test pits will be paid for under EXCAVATION or when required by Contract Documents, HAND/PNEUMATIC EXCAVATION. See Section 31 23 16 – Excavation for details.

1.04 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

B. Section 31 23 16 - Excavation

C. Section 32 92 19 - Seeding

D. Section 32 12 16 - Paving

E. Section 32 17 23 – Color Seal – Painted Map Color Seal Coats

1.05 EXISTING UTILITIES AND STRUCTURES

A. The term existing utilities shall be deemed to refer to both publicly owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

B. Where existing utilities and structures are indicated on the Contract Drawings, it shall be understood that all of the existing utilities and structures affecting the Work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Contract Drawings. If interference exists, the Contractor shall bring it to the attention of the Engineer as soon as possible. If the Engineer agrees that interference exists, it may modify the design accordingly and to the extent possible. Additional costs to the Contractor, if any, for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to DEP.

D. The Work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to ensure no interruption of existing services. Any damage resulting from the Work of this Contract shall be promptly repaired by the Contractor at its own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at its discretion, have the respective authority to provide such support or protection as may be necessary to ensure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

F. Protection of existing utilities, structures and other facilities: The underground pipes, utilities and structures shown on the Contract Drawings are located according to the best information available but may vary by several feet from both the position and elevation

shown. The Contractor shall explore far enough ahead of its work to determine the exact location and condition of such utilities, structures or facilities so that, before the Work is installed, the Engineer may change the line or grade of the pipe or other facility, should that become necessary to avoid a conflict. Should this exploration reveal that adjustments to the Work are necessary; the Contractor shall immediately notify the Engineer and coordinate with him to adjust the Work in a timely fashion avoiding delays to construction. No request for additional compensation or Contract time (except for a non-compensable time extension at the sole discretion of the Engineer, whose decision shall be final) resulting from encountering utilities or structures not shown, or differing in location or elevation from that shown, will be considered. The Contractor shall explore sufficiently ahead of the Work to allow time for any necessary adjustment without delay occasioned by encountering underground utilities or structures which could have or should have been discovered by timely exploration ahead of the Work shall rest solely with the Contractor.

G. Relocation of existing utilities: The relocation of existing utilities, as noted on the Plans, or for the convenience of the Contractor shall be the responsibility of the Contractor. This work shall be completed by either the forces of the existing utility or the Contractor's forces at the discretion of the responsible utility. If the Work is to be performed by the Contractor, all work shall be done in accordance with the utility company's requirements. Under no circumstances shall the Contractor be authorized extra payment for this work, and all costs for the relocation shall be the responsibility of the Contractor.

H. Any conflicts between the field investigation and the information shown on the Contract Drawings shall be brought to the immediate attention of the Engineer.

I. Where test pits are not shown on the contract drawings, but subsequently required by the Engineer, the pit dimensions are assumed to be a maximum of five (5) foot wide, five (5) foot long, by six (6) foot depth.

1.06 SUBMITTALS

A. Test Pit Schedule

1. The Contractor shall develop a test pit schedule that shall be submitted to the Engineer prior to mobilization. The Contractor shall be responsible for coordinating with the appropriate agency responsible for all utilities present at a given test pit location. Test pit schedule shall be submitted to the appropriate utility representative, 7 days prior to investigation. The Contractor’s test pit schedule shall include, at minimum, the following:
    a. A schematic showing the test pit location(s) relative to adjacent roadways. Test pit locations shall match contract drawings or as directed by Engineer.
    b. The intended depth of each test pit. Proposed test pit depth shall be equal to twelve inches below invert of proposed green infrastructure pipe. If an existing utility is encountered and confirmed at a depth less than 12 inches below invert of proposed pipe, Contractor shall stop work and report findings.

c. The existing utility of concern at the test pit location.

A. Test Pit Investigation Report

1. The Contractor shall record the results of the test pit investigations in a report. The completed report shall be submitted to the Engineer prior to full mobilization to the construction site. The report shall include, at minimum, the following:
   a. Start and completion date of each test pits.
   b. Number of test pits and associated sample number and completed test pit depth to the nearest 0.1 ft.
   c. Description and photographic evidence of soil.
   d. Photos of utility encountered if feasible.
   e. Result of test pit, inclusive of size, material, and type of utility encountered. If no utility is encountered and depth of twelve inches below proposed pipe is reached, this shall be indicated as well.
   f. Pre and post photos of the test pit location showing proper restoration of the area.

1.07 QUALITY CONTROL

A. The entire test pit excavation must be supervised by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall be as shown and specified on the Contract Drawings and herein.
B. All materials to be in accordance with NHDES regulations.

PART 3 EXECUTION

3.01 INSTALLATION

A. Obtain information on buried structures and utilities in the vicinity of the test pit.

B. Coordinate work such that all property, structure, and utility owners are aware of the Work prior to its commencement.

C. Provide the Engineer with 48 hour notice prior to commencement of the Work.

D. Excavate test pits at the locations and to the depths and widths as directed by the Engineer.

E. Excavated material shall be stored, transported and disposed of as specified in Section 31 23 16 - Excavation.

3.02 EXCAVATION AND BACKFILL

CONTRACT GI-CONS-7

SECTION 02 30 00

TEST PITS

A. Perform all work in accordance with applicable excavation, backfill, and compaction requirements noted elsewhere in the Contract Documents.

B. Test pits shall be completed in the sequence outlined in Contract Documents unless otherwise approved by the Engineer and DEP.

C. Restore the ground surface to its original condition or better in accordance with the Contract Documents.

D. Repair damage to any component to the standards and satisfaction of the component owner.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 02 41 10
DEMOLITION AND REMOVALS

PART 1 GENERAL

1.01 REQUIREMENTS (NOT USED)

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 32 30 – Job Photographs and Videos

B. Section 01 33 00 – Submittal Procedures

C. Section 01 50 00 – Temporary Facilities and Controls

D. Section 01 57 13 – Temporary Erosion and Sediment Control

E. Section 01 57 23 – Temporary Stormwater Pollution Control

F. Section 01 74 20 – Construction Waste Management

G. Section 02 26 00 – Hazardous Material Assessment

H. Section 31 23 16 – Excavation

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, equipment, sawcutting, excavation, concrete footings, coir drilling, grouting, to the extent applicable, and any other incidental expenses necessary to complete the Work in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid to REMOVE CHAIN-LINK FENCE shall be a unit price per SQUARE FOOT.

C. The price bid to REMOVE AND RESET CHAIN-LINK FENCE shall be a unit price per SQUARE FOOT.

D. The price bid to REMOVE AND RESET STEEL FENCE shall be a unit price per SQUARE FOOT.

E. The price bid to REMOVE AND RESET IRON FENCE shall be a unit price per SQUARE FOOT.

F. The price bid to REMOVE STEEL WICKET FENCE shall be a unit price per LINEAR FOOT.

G. The price bid to REMOVE BARRIER RAIL shall be a unit price per LINEAR FOOT.

H. The price bid to REMOVE CONCRETE CURB shall be a unit price per CUBIC YARD.

I. The price bid to REMOVE STEEL FACED CURB shall be a unit price per LINEAR FOOT.

J. The price bid to REMOVE BASKETBALL BACKSTOP shall be a unit price per EACH.

K. The price bid to REMOVE AND RESET BASKETBALL BACKSTOP shall be a unit price per EACH.

L. The price bid to REMOVE AND RESET BASEBALL BACKSTOP shall be a unit price per EACH.

M. The price bid to REMOVE BENCH shall be a unit price per EACH.

N. The price bid to REMOVE AND RESET BENCH shall be a unit price per EACH.

O. The price bid to REMOVE AND RESET STEEL BOLLARDS shall be a unit price per EACH.

P. The price bid to REMOVE AND RESET GUARD RAIL shall be a unit price per LINEAR FOOT.

Q. The price bid to REMOVE AND RESET TENNIS COURT ACCESSORIES shall be a unit price per EACH set.

R. The price bid to REMOVE AND RESET STREET SIGNS shall be a unit price per EACH.

S. The price bid to REMOVE AND RESET PAVERS shall be a unit price per SQUARE FOOT.

T. The price bid to REMOVE BLUESTONE CURB shall be a unit price per LINEAR FOOT.

U. The price bid to REMOVE SYNTHETIC GRASS SURFACING shall be a unit price per SQUARE YARD.

V. The price bid to REMOVE AND RESET SYNTHETIC GRASS SURFACING shall be a unit price per SQUARE YARD.

W. The price bid to REMOVE AND RESET GAME TABLE AND BENCHES shall be a unit price per EACH game table and set of benches.

X. The price bid to REMOVE AND RESET SAFETY SURFACE shall be a unit price per SQUARE FOOT.

Y. The price bid to REMOVE AND RESET SOCCER GOAL shall be a unit price per EACH soccer goal, including posts, nets, footings, and associated ancillary items, removed or salvaged, stored and reset.

Z. The price bid to REMOVE LAMPPOST, SALVAGE, AND RESET LAMPPOST shall be a unit price per EACH lamppost to be removed or salvaged, stored and reset and shall include the cost of all labor, materials, equipment and incidentals necessary, including coordination to de-energize and reenergize circuits, capping conduits, wiring, testing new components, hardware, storage, materials, grout, cement, core drilling, documentation, cleaning, painting, and finishing, all in accordance with the plans and Specifications to the satisfaction of the Engineer.

AA. The price bid to REMOVE ABANDONED UTILITY PIPING shall be a unit price per LINEAR FOOT.

BB. The price bid to REMOVE TRENCH DRAIN shall be a unit price per LINEAR FOOT.

CC. The price bid to REMOVE AND REPLACE EXISTING AGGREGATE shall be a unit price per CUBIC YARD and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to remove, stockpile, and replace existing aggregate.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.

2. Interruption of utility services. Indicate how long utility services will be interrupted.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Coordination of Owner's continuing occupancy of portions of existing site and of Owner's partial occupancy of completed Work.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

D. Pre-demolition Photographs or Video: Submit before Work begins. All unit items to be removed and reset shall be documented with photographs and notes. The Contractor shall furnish a letter referencing photographs and explicitly listing damaged components. This letter will not be accepted as proof of pre-existing conditions without the signature of the Engineer.

E. Shop Drawings: The shop drawings shall indicate as a minimum: general layout, dimensions, materials, finishes, supports, hardware, fittings, and accessories.

F. Deviations From Layout: Any deviations from the pre-existing location or layout must be submitted for review and approval prior to reinstallation.

G. Materials: Any materials or components to be installed shall be submitted for approval before installation.

1.07 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.08 QUALITY CONTROL (NOT USED)

1.09 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of drainage structure.

2. Demolition and removal of selected site elements including benches, fountains, play equipment, tables, poles, fencing and similar existing facilities.

3. Salvage of existing items to be reused or recycled.

4. Items to be removed and returned to Owner.

1.10 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated by DEP to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and reinstalled.

1.11 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.12 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.

2. Review items stored by the Contractor, delivered to the City, or disposed of off-site.

3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review areas where existing features are to remain and require protection.

1.13 FIELD CONDITIONS

A. Notify Engineer of discrepancies between existing conditions and Contract Drawings before proceeding with selective demolition.

B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

C. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and the City in accordance with Section 02 26 00 – Hazardous Material Assessment. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified in Section 02 26 00 – Hazardous Material Assessment.

2. DEP will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

D. Storage or sale of removed items or materials on-site is not permitted.

E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 PRODUCTS

2.01 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by the City. The City does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings preconstruction photographs preconstruction videotapes and templates.

1. Comply with requirements specified in Section 01 32 30 – Job Photographs and Videos.
2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.

3. Before selective demolition or removal of existing site elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.02 UTILITY SERVICES

A. Existing Services to Remain: Maintain utility services indicated to remain and protect them against damage.

B. Existing Services to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services serving areas to be selectively demolished and/or excavated.

1. Contractor shall facilitate coordination between Engineer and facility manager who will arrange to shut off indicated services/systems when requested by Contractor.

2. Contractor shall arrange to shut off indicated utilities with utility companies in coordination with the facility manager and Engineer.

3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

4. Work herein is considered incidental and no additional payment shall be made.

3.03 BLOCK AND/OR STONE PAVEMENT

A. The Contractor shall remove all flagstone, concrete, hexagonal, and/or granite block pavement set in a sand bed or mortared in a sand/cement grout, all in accordance with the plans, specifications and directions of the Engineer.

B. All materials deemed salvageable shall become the City's property and shall be delivered to a city storage yard specified, or ordered by the Engineer. The Contractor shall notify the Engineer three (3) days in advance of such delivery. All other material shall become the property of the Contractor and properly disposed of.

3.04 BENCH WITH/WITHOUT SLAB (REMOVE AND RESET BENCH)

A. The Contractor shall excavate and remove the existing bench, including slats, legs, concrete footings and concrete slab (whatever is existing) in accordance with the plans, specifications and directions of the Engineer.

B. Where it is necessary to remove a minor quantity of block pavement to facilitate the removal of a bench slab or a bench footing, the Contractor shall remove and reset the block. Payment for removing and resetting block shall be a part of the Allowance.

All materials excavated and removed shall be disposed of off the site by the Contractor at no additional cost to DEP.

BENCH WITH S L A B : The Contractor shall break up and remove bench slabs up to four foot (4'-0") in width using extreme care to not damage adjacent pavement to remain. Contractor shall not remove existing aggregate sub-base.

BENCH WITHOUT SLAB: The Contractor shall remove all bench legs and footings and fill voids where benches will not be replaced.

3.05 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 01 50 00 – Temporary Facilities and Controls.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and/or facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area.

2. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 – Temporary Facilities and Controls.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and structures to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.06 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding,

not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

4. Maintain adequate ventilation when using cutting torches.

5. Comply with Section 01 57 13 – Temporary Erosion and Sediment Control, and Section 01 57 23 – Stormwater Pollution Control, and all governing regulations pertaining to environmental protection.

   a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

   b. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 17 – Cleaning and Site Maintenance.

8. The Contractor shall remove concrete footings from existing materials, that will be removed and reset. Removal of existing footings is included in the bid price herein.

B. Removed and Salvaged Items:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to City.

4. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.07 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. Comply with requirements specified in Section 01 74 17 – Cleaning and Site Maintenance.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.09 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

B. Contractor shall provide on-site dump containers for collection of waste materials, debris and rubbish, and shall wet down dry materials to prevent blowing dust.

C. On a daily basis during the progress of the demolition and removal work or as directed by the Engineer, Contractor shall clean the Site and properties, and dispose of waste materials, debris, and rubbish in accordance with Section 01 74 17 - Cleaning and Site Maintenance.

2.10 REMOVE LAMPPOST, SALVAGE, AND RESET LAMPOST

A. General: Under these items the Contractor shall remove lampposts and either discard them or salvage, store and reset them, as directed by the Engineer. Unless otherwise noted, all work shall conform to specifications for lampposts, luminaires and related electrical work. The Contractor shall coordinate all work with NYC DOT, Division of Street Lighting, to ensure a safe, complete, and satisfactory operation.

B. Removal: Remove existing lampposts as indicated on the plans, approved shop drawings or as directed by the Engineer. When directed to remove lampposts, all materials, including grout, posts, gates, accessories attached to the lampposts shall be cut or broken out from their existing configuration and removed. Cut all posts, bars and ties as required. Grind or drill out fasteners or posts protruding from pavement or walls after removal. Fill holes and voids left in substrate material with appropriate grout or mortar.

When not directed to salvage lampposts, all removed material shall be disposed of by the Contractor. All underlying and adjoining surfaces and materials shall be left in a clean and neat condition. Any damage to surfaces and materials not directed to be removed shall be repaired or replaced at no additional cost to the Owner.

C. Documentation: For lampposts to be salvaged and reset, before removal under these items, the Contractor shall document existing conditions of lampposts with photographs and notes, explicitly marking any components previously damaged or otherwise substandard. The Contractor shall prepare and submit a letter, as described below, to document existing conditions. This letter shall be signed by the Engineer in order to be acceptable as proof of existing conditions. If the Contractor performs any work on existing lampposts without the signature of the Engineer on the letter documenting existing conditions, the Contractor forfeits all right to protest his responsibility for damages and shall replace or repair all damaged lampposts at no additional cost to the Owner.

D. Salvage: When directed to salvage lampposts, all removals shall be handled with extreme care to avoid breakage. Any components which are broken or damaged by the Contractor's operations shall be replaced or repaired at his/her own expense.

E. When lampposts are not to be reset in the same location immediately, they are to be stored until resetting. The Contractor shall be completely responsible for the disposition of salvaged lampposts and shall replace all components that are lost, stolen or damaged during storage, at no additional expense to the Owner. All removed materials to be reset shall be labeled and stored for ease of reinstallation. The Contractor shall be responsible for the safety and security of materials in the time between removal and reinstallation.

F. Reset: Salvaged lampposts shall be cleaned, repainted and reset in their original locations, or as directed by the Engineer. Existing luminaires shall be replaced with NYC DOT or Parks standard LED luminaires. Methods of installation shall conform to specifications for new lampposts in this contract, prevailing best practices and all applicable codes and standards. Work under this item includes, but is not limited to: preparing adjoining components to connect to reset lamppost components, drilling new holes in substrate, grouting posts in holes, fastening to adjoining units, cleaning lampposts, applying touch-up paint, and incidental replacement of miscellaneous missing or damaged hardware.

Any new hardware necessary to complete the safe and satisfactory reinstallation of lamppost shall be furnished under this item at no additional cost to the Owner.

All lampposts shall be replaced or reset to match the adjacent components that are existing to remain, in accordance with DPR standard specifications and details (not included in these Contract Documents). Unless otherwise directed, all requirements of those standards shall apply to reset or replaced lampposts under these items. Reset lampposts and adjoining components of existing lampposts shall be cleaned and repainted to the satisfaction of the Engineer, meeting standard specifications.

The Contractor shall perform the work with all due care, taking precautions to protect the adjacent pavements, lampposts to remain and other structures, and shall repair or replace in-kind any components that have been damaged during removals, storage or reinstallation or are otherwise deemed unsatisfactory by the Engineer due to negligence of the Contractor.

Upon completion of resetting, the Contractor shall take all steps to ensure that the lamppost functions as intended. This shall include, at a minimum, connecting to existing circuits and coordination energizing those circuits with NYC DOT or Con Edison. If power to the lamppost cannot be re-established by those authorities, the Contractor shall be responsible for troubleshooting electrical components within their limits of work and of furnishing other means of proving a complete installation, to the satisfaction of the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Work specified in this Section consists of designing, furnishing materials for, fabricating, erecting, and removing formwork, falsework and shoring for cast-in-place concrete as indicated on the Contract Drawings, specified herein and needed for a complete installation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 11 00 – Summary of Work

B. Section 01 33 00 – Submittal Procedures

C. Section 03 30 00 – Cast-in- Place Concrete

1.03 PAYMENT

1.04 There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.05 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ABBREVIATIONS AND ACRONYMS

1. American Plywood Association (APA)
2. Western Wood Products Association (WWPA)
3. American Concrete Institute (ACI)
4. American Society of Testing and Materials (ASTM)

B. DEFINITIONS

1. Not Used.

C. REFERENCE STANDARDS:

1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
2. ACI 303 - Guide to Cast-in-Place Architectural Concrete Practice.
3. ACI 347 - Guide to Formwork for Concrete.
4. ACI SP-4 - Formwork for Concrete.
5. ASTM A36 – Carbon Structural Steel

6. American Plywood Association (APA): APA Grade - Trademark.

7. New York City Building Code.

8. Western Wood Products Association: WWPA Catalog Use Product Manual.

1.06 REGULATORY COMPLIANCE (NOT USED)

1.07 SUBMITTALS

A. Shop Drawings submitted for approval by the Engineer shall include, but not be limited to, the following data:

1. Design of all field-constructed and prefabricated formwork.

2. For each type of form required, material type, material thickness, finish, and a dimensional cross-sectional profile.

3. Details of erection, including various connections, layouts of form units placement directions, anchoring and support details, attachment of accessories, each condition requiring enclosures, cut opening, special jointing, and other accessories as required to complete the Work.

B. Manufacturer's specifications and installation instructions for each type of required formwork and accessory shall be submitted. These include each type of sheeting, chamfer strips, form facing materials, form ties, form liners, rustication strips, form release agent, dovetail anchor slots, form coating material, form caulking, and similar items.

C. Plan for Reshoring: When reshoring is permitted or required, the operations shall be planned in advance and in accordance with acceptable procedures and the requirements of this Section.

1. The Contractor shall submit as a part of the shop drawings a Plan for Reshoring prepared and sealed by a New York State registered professional engineer.

D. Identify the percentage of recycled material used within the concrete formwork. Twenty percent (20%) of the concrete formwork shall be of recycled content.

E. Identify the percentage of concrete formwork in accordance with the regional content requirements. Ninety percent (90%) of concrete formwork shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii as the crow flies from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

MATERIAL	**DISTANCE FROM THE SITE REQUIREMENT**
Concrete Formwork	500 miles

CONTRACT GI-CONS-7
SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

1.08 DESCRIPTION

A. Job Conditions

1. Formwork materials shall be protected before, during and after erection to insure acceptable finished concrete Work. In-place materials and other operations of work in connection with concrete pours shall be protected.

2. In the event of damage to erected forms, necessary repairs or replacements prior to concrete pours shall be performed at no expense to the DEP.

3. The Contractor shall allow sufficient time, as determined by the Engineer from the approved schedule, between erection of forms and placing of concrete for the various trades to properly install their Work.

4. External or superimposed loads, lateral or vertical, shall not be applied on casting concrete until concrete has developed specified 28-day compressive strength and a minimum age of 14-days.

5. Stay-in-place forms are not permitted unless otherwise shown on the Contract Drawings.

B. Design of Formwork:

1. Formwork shall be designed and constructed in compliance with ACI SP-4 and, if applicable, ACI 303.

2. The Contractor shall assume responsibility for the design, engineering and construction of formwork. Forms shall be designed to produce concrete members identical in shape, lines and dimensions to members shown on the Contract Drawings.

3. The formwork shall be designed for the loads and lateral pressures in accordance with ACI 347 and wind loads as specified by the New York City Building Code.

4. Construction and control joints, openings, offsets, keyways, recesses, moldings, chamfers, blocking, screeds, bulkheads, waterstops, anchorages, inserts, and other features shall be provided as required.

5. Formwork shall be designed to be readily removable without impact, shock, or damage to 'green' concrete surfaces and adjacent materials.

6. The maximum deflection of facing materials reflected in concrete surfaces exposed to view shall be 1/240 of the span between structural members. The formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.

7. Formwork surface materials shall meet the requirements of Section 03 35 00 - Concrete Finishing.

1.09 QUALITY ASSURANCE

A. Unless otherwise noted in the Contract Documents, formwork shall be constructed so that the concrete surfaces will conform to the tolerance limits as given in ACI 117.

B. A full-size mock-up of a cast-in-place wall shall be erected on the Site where directed. Mock-up shall conform to requirements of Section 03 35 00 - Concrete Finishing.

C. Shop Drawings approvals shall be obtained before custom fabrication is started and before delivery of materials to the Project Site.

D. Work of this Section shall be coordinated with the Work of other trades so that construction is not delayed.

E. Formwork erection procedures and health and safety of the Work force shall be the responsibility of the Contractor. The requirements of authorities having jurisdiction shall be complied with.

F. Errors of detailing and fabrication and the correct fit of the formwork shall be the responsibility of the Contractor.

G. Materials, fabrications and workmanship found defective shall be promptly removed and replaced and new acceptable Work shall be provided in accordance with Contract requirements at no additional expense to the DEP.

H. Design of formwork layout, spans, fastenings, joints, and framed openings shall be under the direct supervision of a Professional Engineer, who is licensed and registered in the State of New York and experienced in structural design of formwork.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered to the Site in an undamaged condition and at such intervals as will avoid delay in the Work.

B. Material shall be stored and protected in a clean, properly drained location. Material shall be kept off the ground under a weather-tight covering permitting good air circulation. Formwork materials shall be stored on dry wood sleepers, pallets, platforms or other appropriate supports which have slope for positive drainage. Materials shall be protected from distortion, excessive stresses, corrosion and other damage. Materials shall not be stored on the structure in a manner that might cause distortion or damage to the supporting structure. The maximum uniform distributed storage load shall not exceed twenty (20) pounds per square foot.

C. Material shall be handled safely in a manner that will prevent distortion or other damage. Care shall be exercised at all times to avoid damage through careless handling during unloading, storing and erecting. Panels shall be supported by using strong backs while lifting panels in a horizontal position.

PART 2 PRODUCTSMANUFACTURERS

2.1 MANUFACTURERS

A. A-2 Cone Snap-in Form Tie shall be as manufactured by:

1. Dayton Superior, Miamisburg, OH.
2. Williams Form Engineering Corp, Belmont, MI.
3. Symons Corp, Des Plains, IL.
4. Or approved equal.

B. Form caulking shall be as manufactured by:

1. Series 1200 Construction Caulking; GE Silicones/Momentive Performance Materials, Inc., Waterford, NY.
2. Dow Corning 999-A; Dow Corning Co., Auburn, MI.
3. Or approved equal.

C. Form release agent shall be as manufactured by:

1. Specco F-100; Specco Industries, Inc., Lemont, IL.
2. Debond Form Coating; L&M Construction Chemicals, Inc., Omaha, NE.
3. Magic Kote; Symons Corporation, Des Plaines, IL.
4. Or approved equal.

D. Form film shall be as manufactured by:

1. Symons Corporation, Des Plaines, IL.
2. Or approved equal.

E. Form liners shall be as manufactured by:

1. Dura-Tex; Symons Corporation, Des Plaines, IL.
2. Or approved equal.

F. Rustications shall be as manufactured by:

1. Symons Corporation, Des Plaines, IL.
2. Or approved equal.

2.2 MATERIALS / EQUIPMENT

A. Lumber

1. Only stress-grade lumber shall be provided. Form framing, sheathing and shoring shall conform to WWPA Catalog A.

2. For lumber in contact with concrete, the lumber shall be provided with dressed or tongue-and groove edges on at least the side contacting the concrete, unless otherwise indicated on the Contract Drawings.

B. Plywood

1. Only grade-marked plywood conforming to APA shall be provided.

2. B-B Plyform, Exterior Class 1 or 2, or High Density Overlay (HDO) form plywood, Class 1 or 2 conforming to U.S. Product Standard PS-1 shall be provided.

3. Thickness shall be as required to maintain alignment and surface smoothness, but not less than five-eighths (5/8) inch thick.

C. Steel Forms

1. Commercial grade sheets not less than 16 gage shall be provided.

2. Steel forms in rust-free condition shall be maintained by use of steelwool and light grinding, followed by coats of the specified release agent.

3. Stock material that is free from warps, bends, kinks, cracks, and rust or other matter that could stain the concrete shall be provided.

4. Panels shall be fabricated in conformance with the approved submittals.

5. Outward facing surfaces shall be reinforced as required to prevent warpage and deformation during concrete placement.

D. Form Ties

1. Commercially manufactured type form ties, hangers, and clamps of such type that, after removal of the forms, metal will not be closer than concrete cover as indicated on the Contract Drawings from concrete surface shall be provided. Non-fabricated wire ties will not be permitted.

2. A cone-shaped, snap-in type form tie suitable for the intended use with a working load as required and an integral hot forged head shall be provided.

3. Ties with swaged washers or other suitable devices to prevent seepage of fluid along the ties shall be provided. Ties shall be left in place. She-bolt with water seals shall be provided.

4. Form ties for all liquid-retaining structures shall have waterstop at mid-thickness of wall.

5. Lugs, cones, washers, or other devices which do not leave holes or depressions greater than one (1) inch in diameter shall be provided.

E. Chamfer Strips

1. Three-quarter (3/4) inch by three-quarter (3/4) inch triangular fillets shall be provided, all of which shall be milled from clear, straight-grain pine, surfaced each side, or all of which shall be extruded vinyl type with or without nailing flange unless otherwise indicated on the Contract Drawings.

F. Inserts

1. Galvanized cast steel or galvanized welded steel inserts, complete with anchors to concrete and fittings such as bolts, wedges and straps shall be provided.

G. Dovetail Anchor Slots

1. Dovetail anchor slots manufactured from 22 gage, electro-galvanized steel with removable felt or polyurethane filler shall be provided, where indicated on the Contract Drawings.

H. Shop Fabricated Form

1. Forms shall be fabricated in accordance with the approved submittals.

2. Forms shall be maintained clean, smooth, and free from imperfections and warpage.

3. Locate joints as indicated on the approved Shop Drawings.

   a. Form panels shall be arranged in symmetrical patterns conforming to the general lines of the structure.

   b. Except when otherwise indicated on the Contract Drawings, panels on vertical surface shall be oriented with the long dimension horizontal joints level and continuous.

   c. Form panels on each side of the panel joint shall be precisely aligned by means of fasteners common to both panels, to result in a continuous, unbroken concrete surface.

   d. Largest stock size practicable shall be provided.

   e. Between form joints, areas less than the stock size of the form liner material shall be lined with a single piece of liner material.

I. Form Caulking

1. Form caulking shall be a one-component, gun-grade silicone sealant that is capable of producing flush, watertight and non-absorbent surfaces and joints. Sealant shall be compatible with the type of forming material and concrete ingredients used.

J. Form Release Agent

1. Form release agent shall be a VOC compliant commercial formulation form-coating compound that will not bind with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring

bond or adhesion, nor impede wetting of surfaces to be cured with water or curing compounds. Form release agent shall be a nonreactive type as approved by ANSI/ASF.

K. Form Film

1. Form film shall conform to the requirements of Paragraph 2.11.A.

a. Thinner shall be provided as recommended by manufacturer of the form film.

L. Form Liners

1. Form liners shall be provided as specified herein and/or shown on the Contract Drawings.

M. Rustications

1. Rustications shall be provided as specified herein and/or shown on the Contract Drawings.

PART 3 EXECUTION

3.2 EXAMINATION / PREPARATION

A. Field Measurements

1. Prior to commencement of the Work, existing dimensions, elevations, locations and conditions applicable to the Work shall be field verified. Variances and discrepancies from the Contract Drawings and potential interferences shall be reported promptly to the Engineer.

2. Sufficient field measurements shall be taken prior to preparation of Shop Drawings and fabrication of construction materials, where possible, to ensure proper fitting of the Work. However, job progress shall not be delayed. The Contractor shall allow for adjustments and fittings wherever the taking of field measurements before fabrication may not be possible or might delay the Work.

3. Actual field-verified conditions may require modifications to the fabrication and/or erection details as indicated on the Contract Drawings. The Work shall be performed to meet actual field conditions encountered.

B. Preparation

1. The Contractor shall examine the areas and conditions under which the Work of this Section is to be performed. Conditions detrimental to the proper and timely completion of the Work shall be corrected. Work shall not proceed until unsatisfactory conditions have been corrected. Prior to placement of concrete, forms shall be inspected for cleanliness and accuracy of alignment.

2. Earth cuts shall not be used as forms for vertical surfaces, unless noted on the Contract Drawings.

3. Where different levels are indicated for wall footings, the footings shall be stepped. Unless otherwise indicated on the Contract Drawings, steps in wall footings shall not be of greater height than the thickness of the footings and steps shall not lap less than six (6) inches. No form shall be set at the back of such steps and where earth has slumped off in such locations it shall be cut back to a vertical plane just before the concrete is placed.

3.2 IMPLEMENTATION

A. Erection and Installation

1. Forms shall be constructed in accordance with ACI 347 to required dimensions, plumb, straight and mortar tight, and all joints and seams shall be made mortar-tight. Forms shall be substantial, properly braced, and tied together to maintain position and shape and to resist all pressures to which they may be subject. Unless otherwise noted on the Contract Drawings, formwork shall be constructed so that the concrete surfaces will conform to the tolerance limits in ACI 117.

2. The size and spacing of studs and wales shall be determined by the nature of the Work and the height to which concrete is placed. Forms shall be made adequate to produce true, smooth surfaces.

3. Forms shall be supplied for repeated use in sufficient number to ensure the required rate of progress. Forms shall be cleaned and inspected immediately prior to depositing concrete. Deformed, broken or defective forms shall be removed from the Work.

4. Joints shall be snug and tight and shall occur only at the designated locations. Construction and control joints other than those shown on the Contract Drawings shall be approved by the Engineer. Horizontal joints shall be level, and vertical joints shall be plumb. Joints shall be made perpendicular to the main reinforcement except where otherwise indicated on the Contract Drawings.

5. Temporary openings shall be provided where interior area of formwork is inaccessible for cleanout or inspection before concrete placement, and for placement of concrete. Temporary openings shall be securely braced and set tightly to forms to prevent the loss of concrete mortar. Temporary openings shall be located on forms in locations as inconspicuous as possible consistent with the requirements of the Work.

6. Openings shall be provided in concrete formwork of the correct size and in the proper location to accommodate other operations of construction work in the Project. Expansion joint material, waterstops, and other embedded items to be built into forms shall be accurately placed and securely supported against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent the entry of concrete into the voids.

7. Edge forms or bulkheads and intermediate screed strips for slabs shall be set to obtain required elevations and contours in the finished slab surface.

8. Forms shall be set sufficiently to prevent joints in wood forms from opening prior to concrete pour.

9. Cutting form ties back from the face of the concrete shall not be permitted.

10. Formwork shall be observed continuously while concrete is being placed to see there are no deviations from desired elevation, alignment, plumbness and camber. If, during casting, weakness develops and the formwork shows settlement, deflection or distortion, the Work shall be stopped, improperly cast concrete shall be removed and the formwork shall be reconstructed to perform properly.

    a. Forms for columns, beams, girders, walls and window openings shall be erected in accordance with ACI 117, with a maximum camber of three-quarter (3/4) inch in twenty (20) feet. Column sides shall be clamped with metal column clamps, or equal, spaced according to manufacturer's recommendation. Exposed external angles of columns, beams, girders and walls, except where specially shown on the Contract Drawings shall be provided with three-quarter (3/4) inch bevel strips securely nailed on all concrete formwork including concrete encasement of structural steel shapes.

11. Form release agents shall be applied in accordance with manufacturer's instructions and as specified herein:

    a. Form contact surfaces shall be coated with form release agent compound before reinforcement is placed. Excess form release agent material shall not be allowed to accumulate in the forms or to come into contact with surfaces which are required to be bonded to fresh concrete such as concrete reinforcement and embedded items.

    b. Steel forms shall be coated with non-staining, rust-preventive form oil or otherwise shall be protected against rusting. Rust-stained steel surfaces in contact with concrete shall not be used.

12. Excess form coating material shall not be allowed to accumulate in the forms.

13. Form coatings shall not be allowed to come in contact with construction joints or reinforcing steel.

14. Runways for moving equipment shall be provided with struts or legs and supported directly on the formwork or structural member without resting on the reinforcing steel.

15. Wood forms shall be constructed for wall openings to facilitate loosening and to counteract swelling of the forms.

16. All sleeves, inserts, anchors, and embedded items required for adjoining work or for support of joining work shall be placed prior to concreting.

17. Architectural Formwork:

    a. Form liners and rustication strips shall be installed in strict accordance with

the manufacturer's written instructions and recommendations. The ends of the form liner pattern shall be clogged and all form joints and edges shall be taped using one-eighth (1/8) inch thick by three-quarter (3/4) inch wide foam tape centered on the joints, then caulked in accordance with the manufacturer's recommendations each time forms are set. A representative of the manufacturer shall be present at the Site to supervise the installation of the form liner for the entire Project.

b. Forms for smooth concrete shall be installed in such a manner that there will be no horizontal form joints, and the forms shall be aligned so that vertical joints occur only at "V-Groove" rustications. Form ties shall be spaced in a uniform pattern vertically and horizontally. Form ties shall be positioned in smooth concrete bands and in panels between "reveal" rustications, if any.

c. Beam and girder soffits shall be erected in accordance with ACI 117 and sufficiently braced, shored, and wedged to prevent deflection. Column sides shall be clamped in accordance with this section with metal column clamps, spaced according to the manufacturer's directions.

B. Reshoring

1. During reshoring the concrete in beams, slabs, columns, or any other structural members shall not be loaded with combined dead and construction loads in excess of the loads permitted by the Engineer for the developed concrete compressive strength at the time of reshoring.

2. Reshores shall be placed after stripping operations are complete but in no case later than the end of the working day on which stripping occurs.

3. Reshoring for the purpose of early form removal shall be performed so that at no time will large areas of new construction be required to support their own weight. While reshoring is under way, no live loads shall be permitted on the new construction. Reshores shall be tightened to carry their required loads but they shall not be overtightened so that the new construction is overstressed. Reshores shall remain in place until the concrete has reached its specified twenty-eight (28) day strength, unless otherwise noted on the Contract Drawings.

4. For floors supporting shores under newly placed concrete, the original supporting shores or reshores shall be left in place. The shoring or reshoring system shall have a capacity sufficient to resist the anticipated loads and in all cases shall have a capacity equal to at least one-half of the capacity of the shoring system above. Reshores shall be located directly under the floors supporting shores unless other locations are permitted or shown on the Contract Drawings.

5. In multi-story buildings reshoring shall be extended over a sufficient number of stories to distribute the weight of newly placed concrete, forms, and construction live loads so the design superimposed loads of the floors supporting shores are not exceeded.

C. Removal of Forms and Ties

1. Forms shall be removed in accordance with ACI 347 recommendations without damage to concrete and in a manner to ensure complete safety to the structure. Forms, form ties and bracing shall not be removed without specific permission of the Contractor's Registered Professional Engineer.

2. Top forms on sloping surfaces of concrete shall be removed as soon as removal operations will not allow the concrete to sag. Any needed repairs or treatment required on sloping surfaces shall be performed at once and shall be followed immediately with the specified curing.

3. Upon removal of forms, the Engineer shall be notified in order that a review of the newly stripped surfaces may be made before patching.

4. Wood forms for wall openings shall be loosened without causing damage to the concrete. The face of concrete shall not be pried against. Only wooden wedges shall be used.

5. Whenever the formwork is removed during the curing period, the exposed concrete shall be cured in accordance with one of the methods specified in Section 03 30 00 - Cast-in-Place Concrete.

6. In general, forms shall not be removed until the concrete has hardened sufficiently to safely support its own load, plus any superimposed load that might be placed thereon. As a minimum the forms shall be left in place for length of time specified below. These times represent cumulative days, not necessarily consecutive, during which the air surrounding the concrete is above fifty (50) degrees F.

	Min Time (days)	**Min Strength (psi)**
1. Curbs and Walks	2	1500
2. Columns	2	2000
3. Side forms for girders and beams	2	2000
4. Walls	2	2000
5. Bottom forms of slabs:		
a. Under 20 feet clear span	7	3000
b. Over 20 feet clear span	10	3500
6. Bottom forms of beams and girders:		
a. Under 10 feet clear span	7	3000
b. Between 10 feet to 20 feet clear span	14	3500
c. Over 20 feet clear span	21	4000

a. These times shall be increased if the concrete temperature following placement is permitted to drop below fifty (50) ºF.

7. Care shall be taken in removing forms, wales, shorings, supports and form ties to avoid spalling or marring the concrete. Rubbed finish, if required, and such patching as may be necessary shall be started immediately after removal.

D. Re-Use of Forms

1. Forms for re-use shall meet requirements for new forms with respect to effect on cast-in-place concrete appearance and structural stability.

2. Re-use of forms shall in no way delay or change the concrete placement schedule as compared to the schedule obtainable if all forms were new (in the case of wood forms) or if the total required forms were available (in the case of metal forms).

3. Formwork shall be cleaned and re-oiled prior to re-use. Plywood forms shall not be re-used if unused holes from form ties exist from a previous use. High density overlay plywood panels shall be thoroughly cleaned and lightly recoated before each additional use. Wood forms shall not be used more than three times.

3.3 ADJUSTING / PROTECTION / CLEANUP

A. Protection

1. During installation, the forms shall not be used as a storage platform nor as a working platform until the forms have been permanently fastened in position.

2. The surface of installed forms shall not be overloaded.

END OF SECTION

CONTRACT GI-CONS-7

SECTION 03 21 00

REINFORCING STEEL

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 30 00 - Cast-In-Place Concrete.

B. Section 03 45 00 - Precast Structural Concrete

1.3 PAYMENT

A. The price bid for STEEL REINFORCING BARS shall be unit price per POUND and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, to include steel reinforcement bars where required, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. ACI SP66 - Detailing Manual.

D. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

E. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.

F. ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement

G. ASTM A1064 - Steel Welded Wire Reinforcing, Plain, for Concrete Reinforcement

H. ASTM A496 - Steel Wire, Deformed, for Concrete Reinforcement.

I. ASTM A497 - Steel Welded Wire Reinforcing, Deformed, for Concrete Reinforcement

J. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

K. ASTM A616 - Rail-Steel Deformed and Plain Bars for Concrete Reinforcement

L. ASTM A617 - Axle-Steel Deformed and Plain Bars for Concrete Reinforcement

M. ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement

N. ASTM A767 - Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement

O. ASTM A775 - Epoxy-Coated Reinforcing Steel Bars.

P. CRSI DA4 - Concrete Reinforcing Steel Institute Manual of Standard Practice

Q. NYCBC New York City Building Code

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. The Contractor shall submit placing drawings, Shop Drawings and material Specifications for the approval of the Engineer. Submittals shall include, but not limited to:

1. Detailed placing and shop fabricating drawings, prepared in accordance with ACI 315 and ACI SP66 shall be furnished for all concrete reinforcing. These fabricating drawings shall be made to such a scale as to clearly show joint locations, openings, and the arrangement, spacing and splicing of the bars.
2. Certified copies of mill reports shall accompany all deliveries of reinforcing steel.
3. Description of the reinforcing steel manufacturer's marking pattern.
4. Description of proposed supports for each type of reinforcing.
5. Description of reinforcing weld locations and weld procedures.
6. Adhesive dowel test plan in accordance with section 1.7 E, below.

B. The Contractor shall also include the following:

1. Requests to relocate any bars that cause interferences or that cause placing tolerances to be violated.
2. Request to use splices not shown on the Contract Drawings.
3. Request to use mechanical couplers along with manufacturer's literature on mechanical couplers with instructions for installation, and certified test reports on the couplers' capacity.
4. Request for placement of column dowels without the use of templates.
5. Request and procedure to field bend or straighten partially embedded reinforcing.
6. Request to use adhesive dowels at locations not shown on the Contract Drawings.

C. Identify the percentage of recycled material used within the reinforcing steel. Twenty percent (20%) of the reinforcing steel shall be of recycled content.

D. Identify the percentage of reinforcing steel in accordance with the regional content requirements. Ninety percent (90%) of reinforcing steel shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii as the crow flies from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

Material	**Distance from the Site Requirement**
Reinforcing Steel	500 miles

1.7 QUALITY CONTROL

A. The Contractor shall provide samples from each load of reinforcing steel delivered in a quantity adequate for testing.

B. Where welded splices are allowed by the Engineer, the Contractor shall provide samples of each type of welded splice used in the Work in a quantity and of dimensions adequate for testing. At the discretion of the Engineer, radiographic testing of direct butt welded splices will be performed. The Contractor shall provide assistance necessary to facilitate testing. The Contractor shall repair any weld which fails to meet the requirements of AWS D1.4.

C. The testing will be performed by QA/QC consultant employed and paid by the DEP to ensure that reinforcing steel and welded splice comply with the technical requirements of the Contract.

D. The Contractor shall be charged by the DEP for the cost of any additional tests and investigation on Work performed which does not meet the specifications.

E. Adhesive Dowel Testing:

1. At all locations where adhesive dowels are shown on the Contract Drawings, at least fifteen percent (15%) of all adhesive dowels installed shall be tested to the value indicated on the Contract Drawings, with a minimum of one (1) tested dowel per group. If no test value is indicated on the Contract Drawings but the installed dowel is under direct tension, the Contractor shall notify the Engineer to verify the required test value.

2. Contractor shall submit a plan and schedule indicating locations of dowels to be tested, load test values and proposed dowel testing procedure (including a diagram of the testing equipment proposed for use) prior to conducting any testing. The testing equipment shall have a minimum of three (3) support points and shall be of sufficient size to locate the edge of supports no closer than two (2) times the anchor embedment depth from the center of the anchor.

3. Where Contract Documents indicate adhesive dowel design is the Contractor's responsibility, the Contractor shall submit a plan and schedule indicating locations of dowels to be tested and load test values, sealed by a Professional Engineer currently registered in the State of New York. The Contractor shall also submit documentation indicating the Contractor's testing procedures have been reviewed and the proposed procedures are acceptable.

4. Adhesive dowels shall have no visible indications of displacement or damage during or after the proof test. Concrete cracking observed in the dowel vicinity after loading shall be considered a failure. Dowels and concrete exhibiting damage shall be removed and replaced, as directed by the Engineer. If more than five percent (5%) of tested dowels fail, then one-hundred percent (100%) of dowels shall be proof tested

5. Proof testing of adhesive dowels shall be performed by a NYC Buildings Department approved special inspection agency to perform field testing of the installed concrete anchors in accordance with NYCBC BC 1704.32 and ICC-ES ESR and the applicable sections of ASTM E488 in the presence of the Engineer.

F. Dowel Adhesive System Installer Certification Requirements:

1. All individuals installing dowel adhesive systems shall be trained by the Adhesive Dowel System manufacturer proposed for use in the Work. A representative of the manufacturer shall be on Site prior to adhesive dowel installation to provide instruction on proper installation procedures for all adhesive dowel installers.

2. All adhesive dowel installations in the horizontal or overhead orientation shall be conducted only by personnel certified as an Adhesive Anchor Installer through written and performance tests in accordance with the ACI/CRSI Adhesive Anchor Installer Certification program or equivalent, per ACI 318-11 D.9.2.2. Current AAI Certificate as an Adhesive Anchor Installer shall be submitted to the Engineer of Record for approval prior to commencement of any adhesive anchor installations. The acceptability of certification other than the ACI/CRSI Adhesive Anchor Installer Certification shall be determined solely by the Engineer.

3. Adhesive dowels in the horizontal or overhead orientation shall be continuously inspected during installation by an inspector trained specifically for that purpose.

1.8 DESCRIPTION

A. Placing drawings showing all dimensions necessary for fabrication and placing of the reinforcing steel and accessories without reference to the Project drawings shall be submitted for approval. Approval shall be obtained from the Engineer before fabrication.

B. Details of concrete reinforcement not covered in the Contract shall be in accordance with ACI 315, ACI 318 and CRSI DA4.

C. When it is found necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement, conduits, or embedded items, a submittal showing the resulting arrangement of reinforcement shall be submitted to the Engineer for approval.

D. All reinforcement shall be supported and fastened before concrete is placed and shall be secured against displacement within the tolerances permitted in Article 2.3 B in this Section.

E. All reinforcement, at the time concrete is placed, shall be free of mud, oil or other materials that may adversely affect or reduce the bond. Reinforcement with rust, mill scale or a combination of both shall be considered satisfactory provided the minimum dimensions, weight and height of deformation of a hand-wire-brushed test specimen are not less than the applicable ASTM specification requirement.

F. Templates shall be furnished for placement of all column dowels unless otherwise permitted by the Contract.

G. All splices shall be as indicated on the Contract Documents unless otherwise permitted by the Engineer. Mechanical connections may be used only when permitted by the Engineer.

1. Reinforcement coating shall be removed in the area of the mechanical connection, if so required by the connection manufacturer.

2. After installation of mechanical connections on zinc-coated (galvanized) or epoxy-coated reinforcing bars, coating damage shall be repaired in accordance with the requirements of this Section. All external parts of mechanical connections used on coated bars, including steel splice sleeves, bolts and nuts shall be coated with the same material used for repair of coating damage.

H. Temperature Reinforcing

1. Unless otherwise shown on the Contract Drawings or in the absence of the concrete temperature reinforcing being shown:

   a. The minimum cross-sectional area of horizontal and vertical concrete temperature reinforcing in walls shall be 0.0033 times the gross concrete area.

   b. The minimum cross-sectional area of temperature reinforcing perpendicular to the principal reinforcing in slabs shall be 0.0020 times the gross concrete area.

2. Temperature reinforcing shall not be spaced further apart than five (5) times the slab or wall thickness, nor more than eighteen (18) inches.

1.9 DELIVERY, STORAGE, AND HANDLING

A. All reinforcing shall be neatly bundled and tagged for placement when delivered to the job Site. Bundles shall be properly identified for coordination with mill test reports.

B. Coating damage zinc-coated (galvanized) reinforcing bars due to handling, shipping and placing shall be repaired in accordance with the requirements of this Section.

C. Equipment for handling epoxy-coated reinforcing bars shall have protected contact areas. Bundles of coated bars shall be lifted at multiple pickup points to prevent bar-to-bar abrasion from sags in the bundles. Coated bars or bundles of coated bars shall not be dropped or dragged. Coated bars shall be stored on protective cribbing. Coating damage due to handling, shipping and placing shall be repaired in accordance with the requirements of this Section.

D. Reinforcing steel shall be stored above ground on platforms or other supports and shall be protected from the weather at all times by suitable covering. It shall be stored in an orderly manner and plainly marked to facilitate identification.

E. Reinforcing steel shall at all times be protected from conditions conducive to corrosion until concrete is placed around it.

F. The surfaces of all reinforcing steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcing shall be reinspected and if necessary recleaned.

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Dowel Adhesive System

1. The adhesive system shall be:

a. HIT HY-200 Injection Adhesive Anchor System as manufactured by Hilti, Inc., Plano, TX;

Epcon C6+ System as manufactured by ITW Ramset/Redhead, Glendale Heights, IL;

b. Pure 110+ Epoxy Adhesive Anchor System as manufactured by Powers/Dewalt, Brewster, NY.

c. Sikadur Injection Gel as manufactured by Sika Corp., Lyndhurst, NY.

d. Or approved equal.

2.2 MATERIALS / EQUIPMENT

A. Reinforcement

1. Reinforcing Steel:

a. All reinforcing steel shall be deformed except spirals and welded wire reinforcing, which may be plain bars. Reinforcement shall be the grades required by the Contract Documents and shall conform to one of the following specifications:

1) ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

2) ASTM A616 - Rail-Steel Deformed and Plain Bars for Concrete Reinforcement (including supplementary requirements S1).

3) ASTM A617 - Axle-Steel Deformed and Plain Bars for Concrete Reinforcement.

4) ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

5) Wire or wire fabric with a specified yield strength fy exceeding 60,000 psi shall have the stress fy corresponding to a strain of 0.35 percent.

6) Reinforcing steel shall conform to the applicable requirements of Sections 03 30 00 – Cast-in-Place Concrete, 03 45 00 - Precast Structural Concrete, and the New York City Building Code.

2. Coated Reinforcing Bars:

a. Reinforcing bars shall be zinc-coated (galvanized) or epoxy-coated. The reinforcing bars to be coated shall conform to the requirements of this Section.

1) Zinc-Coated (Galvanized) Reinforcing Bars: Zinc-coated (galvanized) reinforcing bars shall conform to ASTM A767. Supplementary requirements S1 and S2 shall apply when fabrication after galvanization includes cutting and bending. Supplementary requirement S2 shall apply when fabrication after galvanization includes only bending. Repair of damaged zinc coating when required shall be made with a zinc-rich formulation conforming to ASTM A767. Repair shall be done in accordance with the material manufacturer's recommendations.

2) Epoxy-Coated Reinforcing Bars: Epoxy-coated reinforcing bars shall conform to ASTM A775. Coating damaged due to shipping, handling and placing need not be repaired in cases where the damaged area is 0.1 square inches or smaller. Repair damaged areas larger than 0.1 square inches with patching material conforming to ASTM A775 and in accordance with the material manufacturer's recommendations. The maximum amount of damage including repaired and unrepaired areas shall not exceed two percent (2%) of the surface area of each bar. Fading of the coating color will not be cause for rejection of epoxy-coated reinforcement.

3. Bar Mats:

a. Bar mats shall be of the clipped type conforming to ASTM A184 and shall be fabricated from reinforcing bars that conform to the requirements of this Section.

1) Bar mats shall be fabricated from zinc-coated (galvanized) reinforcing bars. Metal clips shall be zinc-coated (galvanized). Non-metallic clips may be used. Coating damage at the clipped intersections shall be repaired in accordance with the requirements of this Section.

2) Bar mats shall be fabricated from epoxy-coated reinforcing bars. Metal clips shall be epoxy-coated. Non-metallic clips may be used. Coating damage at the clipped intersections shall be repaired in accordance with the requirements of this Section.

4. Wire:

a. Wire shall be smooth or deformed wire as indicated in the Contract Documents.

1) Smooth wire shall conform to ASTM A82.

2) Deformed wire shall conform to ASTM A496, size D4 and larger.

5. Welded Wire Reinforcing:

a. Welded Wire Reinforcing shall be fabricated from smooth or deformed wire and shall conform to the wire size and wire spacing required or indicated on the Contract Documents. Welded wire reinforcing shall conform to one of the following specifications:

1) Plain wire fabric ASTM 1064, except welded intersections shall be spaced not farther apart than twelve (12) inches in the direction of the principal reinforcement.

2) Deformed wire fabric ASTM A497, except welded intersections shall be spaced not farther apart than sixteen (16) inches in the direction of the principal reinforcement.

6. Spirals:

a. As indicated in the Contract Documents, spirals shall be fabricated from reinforcing bars or wire.

B. Wire Bar Supports

1. Unless noted otherwise on the Contract Drawings, wire bar supports shall be plastic protected in accordance with Class 1, maximum protection in Chapter 3 of CRSI DA4.

C. Coated Wire Reinforcement Supports

1. Epoxy-Coated Reinforcement:

a. Use wire reinforcement supports coated with dielectric material including epoxy or other polymer for a minimum distance of two (2) inches from the point of contact with epoxy-coated reinforcement.

2. Zinc-Coated Reinforcement:

a. Use galvanized wire reinforcements supports or wire reinforcement supports coated with dielectric material with zinc-coated reinforcement.

D. Precast Concrete Reinforcement Supports

1. Concrete supports used for supporting reinforcement shall be not less than four (4) inches square having a compressive strength equal to or greater than the specified compressive strength of the concrete being placed.

E. 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. Embedment Depth:

a. The embedment depth of the bar shall be as shown on the Contract Drawings. Although all manufacturers listed below are permitted, the embedment depth shown on the Contract Drawings is based on “Pure 110+” by DeWalt” ESR 3298 issued 7/2016. If the Contractor submits one of the other named dowel adhesives from the list below, the Engineer shall evaluate the required embedment and the Contractor shall provide the required embedment depth stipulated by the Engineer specific to the approved dowel adhesive.

b. Where the embedment depth is not shown on the Contract Drawings, the embedment depth shall be determined to provide the minimum allowable bond strength equal to the tensile strength of the rebar according to the manufacturer's ICC-ES ESR.

c. The embedment depth shall be determined using the actual concrete compressive strength, a cracked concrete state, and maximum long-term temperature of one-hundred and ten (110) degrees F, unless noted otherwise on the Contract Drawings. In no case shall the embedment depth be less than the minimum, or more than the maximum, embedment depths stated in the manufacturer's recommendations.

3. The adhesive system shall be as specified in this Section:

4. The Engineer's approval is required for use of this system in locations other than those shown on the Contract Drawings.

F. Mechanical Splices:

1. Mechanical splices shall be ACI 318 Type 2 capable of developing both the minimum of one hundred and twenty-five percent (125%) of the specified yield strength of the bar and full tensile strength of the bar. Where the type of coupler used is composed of more than one component, all components required for a complete splice shall be supplied. Where the threaded rebar to be inserted into the coupler reduces the diameter of the bar, the threaded rebar piece shall be provided by the coupler manufacturer.

G. Couplers located at a joint face shall be a type which can be set either flush or recessed from the face as shown on the Contract Drawings. The couplers shall be provided with a manufacturer fabricated temporary plug suitable for long term exposure to water or other corrosive materials. Threaded couplers shall be plugged with plastic plugs which have an 0-ring seal.

2.3 FABRICATION / ASSEMBLING / FINISHES

A. Welding

1. Field welding of reinforcing steel will not be acceptable unless specifically allowed by the Engineer. When required or permitted, all welding of reinforcing bars shall conform to ANSI/AWS D1.4. Unless otherwise permitted by the Engineer, welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.

2. Welding of wire to wire, and of wire or welded wire reinforcing to reinforcing bars or structural steels, shall conform to applicable provisions of ANSI/AWS D1.4 and any supplementary requirements specified by the Engineer for the particular application.

3. After completion of welding on zinc-coated (galvanized) or epoxy-coated reinforcing bars, coating damage shall be repaired in accordance with the requirements of this Section. All welds and all steel splice members when

used to splice bars shall be coated with the same material used for repair of coating damage.

B. Fabrication

1. All reinforcement shall be bent cold unless otherwise permitted by the Engineer.

2. Fabricating Tolerances:

3. Reinforcing bars shall be fabricated in accordance with the standard fabricating tolerances in Figures 4 and 5 of ACI 315. Tolerances shall not permit a reduction in cover.

4. Placing Tolerances for Reinforcement:

Item	Tolerances, Inches
1. Clear distance:	
a. To formed soffit	-1/4
b. To other formed surfaces	±1/4
2. Minimum spacing between bars:	-1/4
3. Clear distance from unformed surface to top reinforcement:	
a. Members 8 inches deep or less	±1/4
b. Members more than 8 inches deep but less than 24 inches deep	-1/4, +1/2
c. Members 24 inches deep or greater	-1/4, +1
4. Uniform spacing of bars, but the required number of bars shall not be reduced:	±2
5. Uniform spacing of stirrups and ties, but the number of stirrups and ties shall not be reduced:	±1
6. Longitudinal locations of bends◦ and ends of reinforcement:	
a. General	±2
b. Discontinuous ends of members	±1/2
7. Length of bar laps:	1-1/2
8. Embedded length:	
a. For bar sizes No. 3 through 11	-1
b. For bar sizes No. 14 and 18	-2

5. When it is necessary to move bars to avoid interference with other reinforcement, conduits or embedded items exceeding the specified placing tolerances, the resulting arrangement of bars shall be subject to approval of the Engineer.

2.4 SOURCE QUALITY CONTROL / SHOP TESTS

A. Testing

1. The Contractor shall provide a certified copy from the reinforcing steel manufacturer of the mill test on each load of reinforcing steel delivered showing physical and chemical analysis, prior to shipment. The Engineer reserves the right to require additional testing as outlined in Article 1.6.A.

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION

A. Not Used

3.2 IMPLEMENTATION

A. Placing

1. Minimum concrete cover for reinforcement, except for extremely corrosive atmosphere, other severe exposures or fire protection shall be as follows unless indicated otherwise on the Contract Documents.

2. Minimum Concrete Cover for Reinforcement:

Item	Minimum Cover, Inches
1. Slabs and Joists:	
a. Top and bottom bars for dry conditions:	
1) No. 11 bars and smaller	3/4
2) No. 14 and No. 18 bars	1-1/2
b. Bars in formed concrete surfaces exposed to water or weather, and over or in contact with sewage and for bottoms bearing on work mat, or slabs supporting earth cover:	
1) No. 5 bars and smaller	1-1/2
2) No. 6 through No. 18 bars	2

Item	Minimum Cover, Inches
2. Beams and Columns:	
a. For dry conditions:	
1) Stirrups, spirals and ties	1-1/2
2) Principal reinforcement	2
b. Exposed to earth, water, sewage or weather:	2
1) Stirrups and ties	2-1/2
2) Principal reinforcement	
3. Walls:	
a. For dry conditions:	
1) No. 11 bars and smaller	3/4
2) No. 14 and No. 18 bars	1-1/2
b. Formed concrete surfaces exposed to earth, water, sewage, weather or in contact with ground	2
4. Footings and Base Slabs:	
a. At formed sides and ends and bottoms bearing on concrete work mat	2
b. At unformed surfaces and bottoms in contact with earth	3
c. Top of footings	Same as slabs
d. Over top of piles	2

3. For bundled bars, minimum concrete cover shall be equal to the equivalent diameter of the bundles but need not be greater than two (2) inches; except for concrete deposited against and permanently in contact with ground, minimum cover shall be three (3) inches. The equivalent diameter of the bundle shall be based on a single bar of a diameter derived from the equivalent total area.

4. Unless otherwise indicated on the Contract Documents, reinforcement supported from the ground or mud mat shall rest on precast concrete blocks not less than four (4) inches square and having a compressive strength equal to or greater than the specific compressive strength of the concrete being placed. Other means of support may be used if accepted by the Engineer.

5. Reinforcement supported from formwork shall rest on bar supports made of concrete, metal, plastic or other acceptable materials. Where the concrete surface will be exposed to the weather in the finished structure, the portions of all bar supports within one-half (1/2) inch of the concrete surface shall be non-corrosive or protected against corrosion.

6. Zinc-coated (galvanized) reinforcing bars supported from formwork shall rest on galvanized wire bar supports coated with dielectric material or on bar supports made of dielectric material or other acceptable materials. All other reinforcement and embedded steel items in contact with galvanized reinforcing bars or within a minimum clear distance of two (2) inches from galvanized reinforcing bars unless otherwise required or permitted shall be galvanized.

7. Epoxy-coated reinforcing bars supported from formwork shall rest on coated wire bar supports or on bar supports made of dielectric material or other acceptable materials. Wire bar supports shall be coated with dielectric material for a minimum distance of two (2) inches from the point of contact with the epoxy-coated reinforcing bars. Reinforcing bars used as support bars shall be epoxy coated. In walls having epoxy-coated reinforcing bars, spreader bars, where specified, shall be epoxy coated. Proprietary combination bar clips and spreaders used in wall with epoxy-coated reinforcing bars shall be made of corrosion-resistant material or coated with dielectric material.

8. Zinc-coated (galvanized) reinforcing bars shall be fastened with zinc-coated tie wire or non-metallic-coated tie wire or other acceptable materials.

9. Epoxy-coated reinforcing bars shall be fastened with nylon-epoxy or plastic-coated tie wire; or other acceptable materials.

10. Welded wire reinforcing for slabs on grade shall extend to within two (2) inches of the concrete edge. Welded wire reinforcing may extend through the contraction joints. Welded wire reinforcing shall be adequately supported during placing of concrete to assure proper positioning in the slab.

11. Bending or straightening of bars partially embedded in concrete shall not be permitted except when specifically approved by the Engineer. Bending and preheating shall be in accordance with the requirements of this Section.

B. Bending of Bars

1. Minimum Inside Bend Diameters:

a. The minimum inside bend diameters shall conform to the following requirements unless otherwise permitted by the Engineer.

Bar Size	Minimum Diameter
No. 3 through 8	6 bar diameters
No. 9, 10, 11	8 bar diameters
No. 14 and 18	10 bar diameters

2. The beginning of the bend shall not be closer to the concrete surface than the minimum diameter of bend. Preheating, if required, shall be in accordance with the requirements of the Section. The following requirements shall be adhered to for individual bar sizes:

Bar Size	BEND REQUIREMENTS
No. 3 through No. 5	Bars may be cold bent the first time. Cold bend bars only when temperature is above 32 degrees Fahrenheit. Preheating is required for subsequent straightening or bending.
No. 6 and larger	Preheating is required.

3. When zinc-coated (galvanized) or epoxy-coated reinforcing bars are field bent, coating damage shall be repaired in accordance with the applicable requirements of the Section.

C. Preheating of Bars

1. Preheating prior to bending or straightening, when required, shall be in accordance with the following requirements:

   a. The preheat shall be applied to a length of bar equal to at least five (5) bar diameters each way from the center of the bend except that preheat shall not extend below the surface of the concrete. The temperature of the bar at the concrete interface shall not exceed five-hundred (500) degrees Fahrenheit.

   b. The preheat temperature shall be eleven-hundred to twelve-hundred (1100 to 1200) degrees Fahrenheit.

   c. The preheat temperature shall be maintained until bending or straightening is complete.

   d. The preheat temperature shall be measured by temperature measurement crayons, contact pyrometer or other acceptable method.

e. Heated bars shall not be artificially cooled until the material temperature is less than six-hundred (600) degrees Fahrenheit.

2. Preheating may be applied by any method which does not harm the bar material or cause damage to the concrete.

D. Splicing

1. Reinforcing bar splices shall only be used at locations shown on the Contract Drawings. When it is necessary to splice reinforcing at points other than where shown, the character of the splice shall be approved by the Engineer.

2. The length of lap for reinforcing bars, unless otherwise shown on the Contract Drawings shall be in accordance with ACI 318 for a class B splice.

3. Laps of welded wire reinforcing shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one (1) tie for each two (2) running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

4. Mechanical and welded splices shall be used only where shown on the Contract Drawings or when approved by the Engineer.

5. The couplers shall be sealed during concrete placement to completely eliminate concrete or cement paste from entering. After the concrete is placed, couplers intended for future connections shall be plugged and sealed to prevent any contact with water or other corrosive materials. Threaded couplers shall be plugged with plastic plugs which have an 0-ring seal.

E. Dowel Adhesive System Installation

1. The installation of the dowels shall be done in strict conformance with the manufacturer's recommendations. The dowels shall be supported in the correct position until the adhesive sets and gains enough strength to prevent any dislocation.

2. Perform adhesive dowel testing in accordance with the Article 1.7E requirements.

3. If the dowels are required to have a hook at the end to be embedded in the new Work, an approved mechanical coupler shall be provided at a convenient distance from the face of existing concrete to facilitate the testing.

F. Miscellaneous Installation Requirements

1. Exposed Reinforcement:

a. Reinforcement left exposed for the bonding of future construction shall be effectively protected from corrosion by encasement in cement mortar or by other temporary covering as approved by the Engineer.

2. Field Cutting of Reinforcement:

a. Reinforcement shall not be cut in the field except when specifically permitted by the Engineer in writing. The Contractor shall field locate reinforcing steel using non-destructive means prior to cutting concrete (for localized demolition, coring for anchor installation, etc.

3. Reinforcement Through Expansion Joint:

a. Reinforcement or other embedded metal items bonded to the concrete shall not be continuous through any joint intended as an expansion joint. Dowels bonded on only one (1) side of a joint and waterstops may extend through the joint.

3.3 FIELD TESTING / QUALITY CONTROL

A. Inspection

1. No concrete shall be deposited until the Engineer has inspected the placing of the reinforcing steel and has given permission to place the concrete. Concrete placed in violation of this provision may be rejected with subsequent removal by the Contractor.

2. The Contractor shall advise the Engineer of his intentions to place concrete and shall allow him adequate time to inspect all reinforcing steel before concrete is placed.

3. The Contractor shall advise the Engineer of his intentions to place grout in masonry walls and shall allow him adequate time to inspect all reinforcing steel before grout is placed.

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 10 00 – Concrete Forming and Accessories

B. Section 03 32 00 - Joints in Concrete

C. Section 03 21 00 – Reinforcing Steel

D. Section 03 35 00 – Concrete Finishing

E. Section 03 60 00 – Grouting

F. Section 11 14 43 – Pedestrian Detection Equipment

G. Section 33 05 19 – Ductile Iron Utility Piping

H. Section 33 42 11 – Stormwater Gravity Piping

1.3 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, bond breaker and sealant, as applicable, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid for CONCRETE SIDEWALK shall be unit price per SQUARE YARD.

C. The price bid for ADA RAMP shall be unit price per EACH ADA RAMP.

D. The price bid for FLARED END SECTION shall be unit price for EACH FLARED END SECTION.

E. The price bid for MISCELLANEOUS CONCRETE shall be unit price per CUBIC YARD. Typical items in this category shall include concrete aprons and sediment pads as required by bioretention areas.

F. The price bid for FOUNDATION MATERIAL FOR CONCRETE shall be unit price per CUBIC YARD.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO M 182 Burlap Cloth Made From Jute or Kenaf

2. AASHTO T 318 Proposed Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying

B. American Concrete Institute (ACI):

1. ACI 116R Cement and Concrete Terminology

2. ACI 117 Standard Tolerances for Concrete Construction and Materials

3. ACI 207.1R Mass Concrete

4. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete

5. ACI 213 Guide for Structural Lightweight-Aggregate Concrete

6. ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete

7. ACI 301 Specification for Structural Concrete

8. ACI 302R Guide for Concrete Floor & Slab Construction

9. ACI 304R Guide for Measuring, Mixing, Transporting and Placing Concrete

10. AC 305R Hot Weather Concreting

11. ACI 306R Cold Weather Concreting

12. ACI 308.1 Specification for Curing Concrete

13. ACI 309R Guide for Consolidation of Concrete

14. ACI 311 Recommended Practice for Concrete Inspection

15. ACI 318 Building Code Requirements for Structural Concrete

16. ACI 347R Guide to Formwork for Concrete

17. ACI 506 Guide to Shotcrete

18. ACI 506.2 Specification for Shotcrete

19. ACI SP-2 ACI Manual of Concrete Inspection

20. ACI SP-15 Field Reference Manual Standard Specifications for Structural Concrete ACI 301 with selected ACI references.

C. American National Standards Institute/National Science Foundation (ANSI/NSF) Standard 61 - "Drinking Water System Components - Health Effect"

D. American Society for Testing and Materials (ASTM)

1. ASTM C 31 Standard Practice for Making and Curing Concrete Test Specimens in the Field

2. ASTM C 33 Standard Specification for Concrete Aggregates

3. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

4. ASTM C 42 Standard Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

5. ASTM C 88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

6. ASTM C 94 Standard Specification for Ready-Mixed Concrete

7. ASTM C 109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars

8. ASTM C 138 Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete

9. ASTM C 143 Standard Test Method for Slump of Hydraulic Cement Concrete

10. ASTM C 150 Standard Specification for Portland Cement

11. ASTM C 157 Standard Test Method for Length Change of Hardened Hydraulic-Cement, Mortar, and Concrete

12. ASTM C 171 Standard Specification for Sheet Materials for Curing Concrete

13. ASTM C 172 Standard Practice for Sampling Freshly Mixed Concrete

14. ASTM C 173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

15. ASTM C 227 Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations

16. ASTM C 231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

17. ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete

18. ASTM C 309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

19. ASTM C 311 Test Method for Sampling & Testing Fly Ash or Natural Pozzolans for Use in Concrete

20. ASTM C 330 Standard Specification for Lightweight Aggregates for Structural Concrete

21. ASTM C 387 Standard Specification for Packaged, Dry Combined Materials for Mortar and Concrete

22. ASTM C 470 Standard Specification for Molds for Forming Concrete Test Cylinders Vertically

23. ASTM C 494 Standard Specification for Chemical Admixtures for Concrete

24. ASTM C 567 Standard Test Method for Density Structural Lightweight Concrete

25. ASTM C 595 Standard Specification for Blended Hydraulic Cements

26. ASTM C 618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

27. ASTM C845 Standard Specification for Expansive Hydraulic Cement

28. ASTM C 881 Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

29. ASTM C 882 Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear

30. ASTM C 979 Standard Specification for Pigments for Integrally Colored Concrete

31. ASTM C 989 Standard Specification for Slag Cement for Use in Concrete and Mortars

32. ASTM C 1064 Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete

33. ASTM C 1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

34. ASTM C 1141 Specification for Admixtures for Shotcrete

35. ASTM C 1157 Standard Performance Specification for Hydraulic Cement

36. ASTM C 1240 Standard Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout

37. ASTM C 1398 Test Method for Laboratory Determination of time of Setting of Hydraulic-Cement Mortars Containing Additives for Shotcrete by the Use of Gillmore Needles

38. ASTM C 1480 Packaged, Pre-Blended, Dry, Combined Materials for Use in Wet or Dry Shotcrete Application

39. ASTM E 329 Standard Specification for Agencies Engaged in the Construction Inspection Testing of Special Inspection

E. The Building Code of the City of New York (NYCBC)

F. Concrete Plant Manufacturer's Bureau (CPMB) - "Concrete Plant Standards."

G. Concrete Reinforcing Steel Institute (CRSI):

1. CRSI – "Manual of Standard Practice"

2. CRSI – "Placing Reinforcing Bars"

H. Definitions

1. Inspection Requirements – Special Inspections requirements of the New York City Building Code as defined in NYCBC 1704.4 shall apply to all applicable materials and construction.

2. Lightweight Concrete - Concrete intentionally made to have low density by use of lightweight aggregate and usually required to have an air-dry unit weight less than one-hundred and fifteen (115) lbs. per cubic foot.

3. Normal Weight Concrete - Concrete for which density is not a controlling attribute, made with aggregates of types covered by ASTM C 33, and usually having unit weights in the range of one-hundred thirty-five to one-hundred sixty (135 to 160) lbs. per cubic foot.

4. Engineer - Professional Engineer designated by the Commissioner, who will be responsible for coordination of Special Inspections and Buildings Form TR1: Technical Report Statement of Responsibility. The Engineer may or may not be the Resident Engineer. The Engineer shall undertake all responsibilities outlined in Article 28 and NYCBC 1704.4 Special Inspections of the New York Building Code.

5. Other technical words and terms used in this Section are defined in ACI 116R.

I. NYCDOT Standard Highway Specifications

J. The Public Rights-of-Way Accessibility Guidelines (PROWAG)

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. General:

1. The Contractor shall submit to the Engineer, in accordance with Section 01 33 00 – Submittal Procedure for all concrete mix designs and cement grout mix designs produced by a ready-mix plant.

2. A new mix design shall be submitted to the Engineer for approval. Prior to changing the brand, type, size or source of cementitious materials, aggregates, water, ice or admixtures, new historical field strength test data, data from new trial mixtures or evidence which indicates that the change will not adversely affect the relevant properties of the concrete shall be submitted.

3. Materials, equipment and aggregates approved by the Materials Bureau of the New York State Department of Transportation (NYSDOT), in the most recent NYSDOT approved lists mentioned below, are acceptable for use without a detailed submission. Submittal is required stating the particular material, equipment or aggregate source to be used with approval identification number, and/or page number.

   a. Materials and Equipment NYSDOT Approved Materials List

   b. Approved List Sources of Fine and Coarse Aggregates

B. Certifications:

1. All materials used in the manufacture of concrete shall be accompanied by a certificate from the manufacturer or fabricator or supplier indicating test results of current production stockpiles or shipments.

2. Submit notarized certification of conformance to referenced standards when requested by Engineer.

C. Delivery Tickets:

1. The Contractor shall submit to the Engineer a copy of the delivery ticket for each load of concrete delivered to the Site. Delivery tickets shall contain all information specified in ASTM C94 Section 14.1.

2. Provide batch tickets for each batch of job-site mixed concrete as specified.

D. Submit samples of materials as specified and as otherwise may be requested by the Engineer, including names, sources, and descriptions.

E. Shop Drawings:

1. Manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.

2. All information pertinent to a concrete plant to be erected at the Site as required by the CPMB Publication "Concrete Plant Standards of the Concrete Plant Manufacturers Bureau."

3. Detailed description of conveying equipment.

4. Detailed description of concrete placement methods.

5. Proposed procedures for bonding new concrete work to existing including manufacturer's information on proposed bonding agents.

6. Proposed normal procedures for protection and curing of concrete including manufacturer's literature for proposed curing compounds.

7. Proposed special procedures for protection of concrete under wet weather placement conditions.

8. Proposed special procedures for protection and curing of concrete under hot and cold weather conditions.

9. Proposed method for underwater placement.

10. Proposed method of measuring concrete surface temperature changes.

11. Detailed procedures and materials for repair of defective concrete.

12. Detailed procedures for removing stains, rust, efflorescence, and surface deposits.

13. Materials and procedures to be used to plug tie holes, other than for Portland cement mortar.

14. The following information, if ready-mixed concrete is used.

a. Identification of Ready-Mixed Concrete Supplier including the plant location and all pertinent information required by the CPMB Publication "Concrete Plant Standards of the Plant Manufacturers Bureau."

b. Locations of sources of materials for cement, fine and coarse aggregates, and water, and the brands and types of admixtures to be used.

c. Physical capacity of mixing plant.

d. Trucking facilities available.

e. Estimated average amount which can be produced and delivered to the Site during a normal eight (8) hour day, excluding the output to other customers.

15. Requests and Notifications:

a. Request to use the volumetric batching method.

b. Request for acceptance of preplacement activities: This request is to ensure that the pre-placement activities are complete and have been properly inspected. The Contractor shall sign-off on a Concrete Placement Card indicating that the Work is complete and is ready for placement. A sample of the required Concrete Placement Card is shown as Attachment 03 30 00 B at the end of this document. The Engineer will sign-off on the items to be inspected but this does not relieve the Contractor from coordinating the concrete placement properly and meeting all requirements of the Contract. The Contractor shall submit the completed Concrete Placement Card to the Engineer in accordance with Article 3.1, Paragraph B - Preparation for Concrete of this Section, and with sufficient time to obtain receipt of authorization from DEP to place concrete in conformance with the latest DEP concrete placing guidelines.

c. Advance notification of forthcoming placement including arrangements to coordinate tests and inspection.

d. Requests to exceed the ASTM C 94 required time of discharge.

F. Test and Inspection Reports:

1. Information on types, classes, procedures, names and plant locations for cementitious materials; types, pit or quarry locations, producers' names, gradations and properties required by ASTM C 33 for aggregates; types, brand names, producers' names for admixtures; and source of supply for water and ice.

2. Except for admixtures and water, test results not more than ninety (90) days old confirming the conformance of all concrete materials with applicable specifications.

3. Testing agencies shall submit the results of all tests and inspections performed during the course of the Work to the Engineer. Reports from the Testing Agency shall be on forms acceptable to the Supervising Engineer for Concrete Inspection.

4. Submit copies of laboratory test reports for concrete cylinders, materials and mix design tests. Review of required submittals shall be by the Project Design Engineer for acceptance unless specifically noted otherwise. Production of concrete to comply with the specified requirements is the responsibility of the Contractor.

5. A complete record of the date and details of each concrete placement including the exact location thereof and the date of removal of forms. This record shall be coordinated with and in addition to that maintained by the Supervising Engineer for concrete inspection.

6. Mixture Proportions:

   a. Mixture proportions conforming to the requirements of the New York City Administrative Building Code and this Section for water/cement ratio, cement content, slump, maximum size of coarse aggregate, air content, admixtures, and chloride concentration, as well as compressive strength.

   b. Method and test data used to establish proportions.

G. Identify the percentage of recycled material used within the concrete mix design. Twenty percent (20%) of the cementitious material shall be fly ash, or, forty percent (40%) of the cementitious material shall be slag cement; see Table 1 at the end of this Specification.

H. Identify the percentage of concrete materials in accordance with the regional content requirements. Ninety percent (90%) of concrete materials shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii as the crow flies from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

Material	Distance from the Site Requirement
Aggregates, Sands	50 miles
Concrete Plants	100 miles

I. ADA Ramps

1. Permit: A pedestrian ramp modify/install permit must be obtained to install any pedestrian ramp, blended transition, or cut-through in any street. One permit is required per corner ID. The Contractor shall contact HIQApedramp@dot.nyc.gov for more information on the type of permit required to complete work.

2. Noncompliance: The Contractor shall be responsible for constructing pedestrian ramps compliant with the Contract Drawings and with the latest information from PROWAG and the NYCDOT Standard specifications. Any ramp that

cannot be fully compliant with ADA Standards, must adhere to as many design standards as is feasible, and prior to construction, a technical infeasibility form (TIF) must be completed, signed, and submitted for approval in a fillable pdf format to NYC DOT Pedestrian Ramp Program at pedrampTIF@dot.nyc.gov , copying the PRP reviewer.

3. Post Construction: For every ADA curb cut ramp constructed, the Contractor's Engineer must perform an inspection to ensure full ADA compliancy. Inspection data must be provided for all proposed ADA ramps for review by PRP. All non-compliant ramps must be reconstructed unless constructed in accordance with an approved TIF. The Contractor shall also submit ADA Ramp as-builts and a transmittal letter that clearly indicate the name and address of the contractor and engineering companies who were responsible for the ramp design, construction and inspection referencing the Ramp approval number with date.

4. See Section 11 14 43 regarding installation and payment for Pedestrian Detection Equipment.

1.7 QUALITY CONTROL

A. General:

1. Work performed under this Section shall comply with the applicable provisions and recommendations in the References Article of this Section.

2. The Contractor shall employ, at its own expense, a testing laboratory experienced in the design and testing of concrete materials and mixes. This laboratory shall be responsible for all concrete mix design and trial batch testing.

   a. Unless otherwise approved, all mix designs shall be run in the presence of DEP designated personnel.

3. Testing agencies that perform testing services on concrete shall meet the requirements of ASTM E 329 and be licensed by the New York City Department of Buildings.

4. Testing laboratory shall have been inspected within the last two (2) years by the Cement and Concrete Reference Laboratory (CCRL) of the National Institute of Standards and Technology for testing concrete aggregates and for the preparation and testing of concrete trial batches with or without admixtures. The laboratory shall provide documentation indicating how any deficiencies in the latest CCRL inspection report have been corrected.

5. Testing and inspection shall be conducted in accordance with the requirements of ASTM C 1077 and other applicable standards.

6. Prior to performing any Work, the qualifications of the proposed testing agency shall be submitted for review and acceptance by the DEP.

7. Tests of concrete required by this Section shall be made by an ACI Concrete Field Testing Technician Grade 1 or equivalent. Equivalent certification programs shall

include requirements for written and performance examinations as stipulated in ACI publication CP1.

8. Prior to approval, all testing of proposed materials and mix designs including trial batch and shrinkage testing shall be at the Contractor's expense.

9. Concrete materials and operations will be tested and inspected by the Engineer or his authorized representative as the Work progresses. Failure to detect defective work or material shall not in any way prevent later rejection when a defect is discovered nor shall it obligate the Engineer for final acceptance.

10. Materials and installed Work may require testing and retesting, as directed by Engineer, at any time during the progress of the Work. Contractor shall allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be done at DEP's expense, including the retesting of rejected materials and installed Work, shall be done at Contractor's expense.

B. Laboratory Trial Batch:

1. Each concrete mix specified shall be verified by a laboratory trial batch, unless indicated otherwise. Each trial batch shall also be witnessed by a DEP representative.

2. Each trial batch shall be reported on DEP's Mix Design Submittal (MDS) forms and shall include the following testing:

   a. Aggregate gradation for fine and coarse aggregates.

   b. Combined aggregate gradation including total percentage of each aggregate size retained on each sieve.

   c. Fly ash or slag cement testing to verify meeting specified properties, unless certification by an independent testing laboratory is provided by the fly ash or slag cement supplier.

   d. Slump.

   e. Air content.

   f. Compressive strength based on three (3) cylinders tested at seven (7) days and three (3) cylinders tested at twenty-eight (28) days (six (6) cylinders minimum.)

   g. Shrinkage test, as specified herein, for Class 45 concrete.

3. Each trial batch shall provide the following information:

   a. Project identification name and number.

      1) Specified strength f'c.

      2) Name of the concrete producer supplying materials.

3) Name of the Design Trial Lab.

b. Date of trial.

c. Complete identification of aggregate source of supply.

d. Tests of aggregates for compliance with specified requirements.

e. Scale weight of each aggregate.

f. Absorbed water in each aggregate.

g. Brand, type and composition of cement.

h. Brand, type and amount of each admixture.

i. Amounts of water used in trial mixes.

j. Proportions of each material per cubic yard.

k. Gross weight and yield per cubic yard of trial mixtures.

l. Measured slump.

m. Measured air content.

n. Shrinkage test results where required and as specified herein.

o. A minimum of three (3) trial runs with different water/cement ratios shall be performed for each mix design proposed.

p. Compressive strength developed at seven (7) days and twenty-eight (28) days, and if required, fifty-six (56) days or longer. A minimum of three (3) test cylinders shall be cast for each seven (7) day, twenty-eight (28) day and/or fifty-six (56) day test for each trial run.

4. The requirement for a trial batch may be waived if the required test information has been provided in a previous laboratory trial batch run on the identical mix design within the previous twelve (12) months and the history of the concrete mix field results are acceptable to the Supervising Engineer for Construction. The same brand, type, source and supplier of all materials must have been used.

5. On the day of the trial test, the laboratory shall provide to the DEP witness a one to two (1-2) lb. neat cement sample for delivery to the DEP Laboratory for chemical composition analysis, for fly ash and slag and cement.

C. Shrinkage Test:

1. Drying shrinkage tests, as specified herein, shall be performed with every trial batch test.

2. Drying shrinkage specimens shall be four (4) inch by four (4) inch by eleven (11) inch prisms with an effective gage length of ten (10) inches, fabricated, cured, dried and measured in accordance with ASTM C 157 modified as follows: Specimens shall be removed from molds at an age of twenty-three (23) ± one (1) hour after trial batching, shall be placed immediately in water at seventy (70) degrees F ± three (3) degrees F for at least thirty (30) minutes, and shall be measured within thirty (30) minutes thereafter to determine original length and then submerged in saturated lime water at seventy-three (73) degrees F ± three (3) degrees F. Measurement to determine expansion expressed as a percentage of original length shall be made at age seven (7) days. This length at age seven (7) days shall be the base length for drying shrinkage calculations ("0" days drying age). Specimens then shall be stored immediately in a humidity control room maintained at seventy-three (73) degrees F ± three (3) degrees F and fifty (50) percent ± four (4) percent relative humidity for the remainder of the test. Measurements to determine shrinkage expressed as percentage of base length shall be made and reported separately for seven (7), fourteen (14), twenty-one (21), and twenty-eight (28) days of drying after initial seven (7) days of moist curing.

3. The drying shrinkage deformation of each specimen shall be computed as the difference between the base length (at "0" days drying age) and the length after drying at each test age. The average drying shrinkage deformation of the specimens shall be computed to the nearest 0.0001 inch at each test age. If the drying shrinkage of any specimen departs from the average of that test age by more than 0.0004-inch, the results obtained from that specimen shall be disregarded. Results of the shrinkage test shall be reported to the nearest 0.001 percent of shrinkage. Compression test specimens shall be taken in each case from the same concrete used for preparing drying shrinkage specimens. These tests shall be considered a part of the normal compression tests for the Project. Allowable shrinkage limitations shall be as specified in Part 2, herein.

1.8 DESCRIPTION

A. Classes of Concrete:

1. Class 25 - use for lean concrete.

2. Class 45 - use for all concrete unless indicated otherwise.

3. Class 50 - use for precast concrete with corrosion inhibitor and crystalline waterproofing in the mix design. This mix shall be used for all precast concrete, unless indicated on the Contract Documents.

B. Work in Connection with other disciplines:

1. All sleeves, inserts, anchors and embedded items required for adjoining work or for its support shall be placed prior to concreting. No concrete shall be deposited until the Resident Engineer or his authorized representative has inspected the placement of the embedded items and the reinforcing bars and has given his permission to place the concrete.

2. All Work related to the concrete or must be supported by it, shall be coordinated with the Work of this Section, including but not limited to the introduction or furnishing of embedded items prior to concrete placement.
3. Electrical conduits, junction boxes or pipes shall be placed prior to concreting. The Contractor shall coordinate the placement of such items of work in order that they are installed in accordance with all requirements of the New York City Building Code. The Contractor shall protect such installations to the extent that they are not displaced or damaged during concrete placement.

4. Openings in slabs shall be provided for pipes, conduits and the like required for the work of others where indicated on the Contract Drawings or for which directions are given prior to placing concrete. When work of others is completed, the excess part of the respective openings shall be completely closed up to the pipe sleeve and/or inserts to match the adjoining work in a manner approved by the Engineer.

5. Sleeves for miscellaneous metalwork, castings, pipes and anchors furnished shall be set true and to proper alignment in the concrete as indicated on the Contract Drawings or required by the manufacturer's templates.

6. Voids in embedments shall be filled temporarily with readily removable material to prevent entry of concrete into the void.

C. ADA Ramps
1. The work includes the construction of the new ADA-compliant pedestrian ramps, flares, landings, and related depressed curbing and transitions. The Contractor shall be responsible for constructing pedestrian ramps compliant with Contract Drawings and the latest information from PROWAG and the NYCDOT Standard specifications.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Cement shall be stored in weather tight buildings, bins or silos which will provide protection from dampness and contamination and will minimize warehouse set.

B. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation or contamination with other materials or with any other sizes of like aggregates. To ensure that this condition is met, any test for determining conformance to requirements for cleanliness and grading shall be performed on samples secured from the aggregates at the point of batching. Frozen or partially frozen particles shall not be used.

C. Stockpiles of natural sand shall be allowed to drain freely to minimize variations in moisture content throughout the stockpile.

D. Admixtures shall be stored in such a manner as to avoid contamination, evaporation or damage. For those used in the form of suspensions or non-stable solutions, suitable agitating equipment shall be provided to assure uniform distribution of the ingredients. Liquid admixtures shall be protected from freezing and other temperature changes which would adversely affect their characteristics. All admixture containers shall be clearly

marked with paint as to their content and dosage.

E. Lightweight Aggregates:
1. Cover or presoak coarse and fine lightweight aggregates when transporting them.

2. Presoak dry lightweight aggregates unless presoaking is not recommended by the aggregate supplier or is not acceptable to the Engineer. Leave presoaked aggregates in the stockpile after soaking for at least twelve (12) hours before using.

3. Do not allow machinery to run over lightweight aggregates.

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS (NOT USED)

2.2 MATERIALS / EQUIPMENT

A. All materials used in concrete or the curing and repair of concrete, which can contact potable water, shall be certified as meeting the requirements of ANSI/NSF 61 for contact with potable water when in the finished concrete.

B. Materials listed in this Section apply to all concrete unless specified otherwise in the Contract.

C. Cementitious Materials

1. General:

a. Portland cement shall be produced by an acceptable, recognized manufacturer. The cement shall be produced by one plant only per mix design. Cement per mix design shall be of one (1) type only.

b. Cement type used shall be appropriate for Site exposures in accordance with NYCBC 1904.4 and ACI 350 06 Table 4.2.2.

c. Alternate cement sources may be used provided that a mix design has been accepted and a trial batch verifying performance has been made.

d. Cement which has deteriorated because of improper storage or handling shall be rejected.

2. Portland Cement:

a. Portland cement, ASTM C 150, Type II; or blended hydraulic cement, ASTM C595 Type IP (MS) or as otherwise specified in the Contract.

b. Total alkalies in the cement, calculated as the percentage of Na2O plus 0.658 times the percentage of K2O) shall not exceed 0.85 percent unless aggregates are shown to be non-reactive in accordance with ASTM C 1778 and ASTM C295. When aggregates are shown by testing to be non-reactive, total alkalies in the cement shall not exceed 1.0 percent.

c. Fly ash and slag cement used in the production of blended cement shall meet the requirements of this Section.

3. Fly Ash and Natural Pozzolans:

a. Fly ash mineral admixture, when used, shall meet the requirements of ASTM C 618 Class F, except as follows:

1) The loss on ignition shall be a maximum of four percent (4%).

2) The maximum percent of sulfur trioxide (SO_3) shall be four (4.0).

b. Natural pozzolan mineral admixture, when used, shall meet the requirements of ASTM C 618 Class N.

c. Fly ash used in the production of Type IP cement shall meet ASTM C595.

d. Fly ash and natural pozzolans used in concrete that contacts potable water shall be certified as meeting the requirements of ANSI/NSF 61.

4. Slag Cement:

a. Slag cement mineral admixture, when used, shall meet the requirements of ASTM C 989, Grade 100 or better.

b. Slag cement will be permitted as a substitute for fly ash or natural pozzolans, at no additional cost to the DEP, in the event that Class F Fly Ash or Class N natural pozzolans are not available. The slag cement substitution shall be in the same proportions and percentages of the total cementitious material as indicated for Fly Ash. A higher percentage of slag cement of the total cementitious material in concrete shall be permitted as approved by the Engineer to suit the Project needs.

c. Laboratory trial batches will be tested to determine compliance with strength requirements, times of setting, slump, slump loss, and shrinkage characteristics.

d. Slag cement used in concrete that contacts potable water shall be certified as meeting the requirements of ANSI/NSF 61.

5. Silica Fume:

a. Silica fume mineral admixture shall be the dry compacted or slurry form and shall meet the requirements of ASTM C 1240. Silica Fume shall be considered to be a cementitious material. Application rate shall be seven percent (7%) by weight of cement, unless indicated otherwise.

b. Product and Manufacturer: Provide one of the following:

1) Masterlife SF100 (formerly Rheomac SF100), as manufactured by BASF Construction Chemicals, LLC.
2) Force 10,000 D, as manufactured by W.R. Grace & Company.
3) Sikacrete 950 DP, as manufactured by Sika Corporation.
4) Eucon MSA, as manufactured by the Euclid Chemical Company.
5) Or approved equal.

D. Aggregate

1. Coarse and fine aggregates shall meet the requirements of ASTM C 33 with the requirements of Table 3, Class 4S. Soundness shall be tested using magnesium sulfate. Abrasion resistance shall be tested using the Los Angeles Abrasion Test. For testing requirements, concrete shall be assumed to be subject to abrasion.

2. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, ochre, or other materials that can cause stains on exposed concrete surfaces. Marine dredged aggregates shall not be used. Recycled aggregates shall not be used for structural concrete (forty-five hundred (4500) psi and higher).

3. The loading, storing, unloading, and batching of aggregates shall be done in such a manner as to prevent segregation, intermingling, or the inclusion of foreign materials. All aggregates shall remain in free drainage storage until a stable moisture content is attained prior to placement in the batching plant bins. Each size of coarse aggregate and the fine aggregate shall be kept in separate hoppers or bins. All aggregates shall be delivered to the batching plant bins by a belt conveyor or other approved means; and the operation thereof shall be controlled so as to prevent the mixing of the sizes and kinds of aggregates with each other. Any mixture of fine and coarse aggregates or of the two sizes of coarse aggregate in the batching plant bins or prior thereto shall be cause for rejection of such materials, and the affected bin or bins shall be emptied and inspected prior to refilling with the correctly graded aggregate.

4. Fine Aggregates:

a. Fine aggregate shall be composed of clean, sharp, hard, strong, durable, insoluble, uncoated, natural sand free from loam, clay lumps or other deleterious substances.

b. Dune sand, bank run sand and manufactured sand are not acceptable.

c. Sand having FM less than 2.40 or greater than 3.00 shall not be allowed.

d. Fine aggregate shall meet the requirements of ASTM C 33 except that loss when

tested for soundness using magnesium sulfate shall not exceed twelve percent (12%).

5. Coarse Aggregates:

   a. Coarse aggregate 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.

   b. Use of slag and pit or bank run gravel is not permitted.

   c. Coarse aggregate gradations shall be as specified in Table 1 - Concrete Mix Requirements and shall meet the requirements of ASTM C 33. All aggregate gradations listed for each concrete class shall be used.

   d. Coarse aggregate shall meet the requirements of ASTM C 33, Table 3, Class 4S, with the following additional requirements.

      1) Clay lumps shall not exceed 1.0 percent by weight of coarse aggregate.

      2) Shale and other soft particles shall not exceed 3.0 percent by weight of coarse aggregate.

      3) Thin, elongated, or laminated particles shall not exceed 3.0 percent by weight of coarse aggregate.

      4) Loss when tested for soundness using magnesium sulfate shall not exceed twelve percent (12%).

   e. Coarse aggregate for lightweight concrete shall conform to ASTM C 330 and shall meet the gradation requirements for three-quarter (¾") to No. 4.

   f. Nominal maximum size of coarse aggregate shall be not larger than:

      1) One-fifth (1/5) the narrowest dimension between sides of forms, nor

      2) One-third (1/3) the depth of slabs, nor

      3) Three-quarter (3/4) the maximum clear spacing between individual reinforcing bars or wires, bundles of bars, individual tendons, bundled tendons or ducts.

   g. The requirements of Article 2.2, Paragraph D.5.f, shall not apply if, in the judgment of the Engineer, workability and methods of construction are such that concrete can be placed without honeycombs or voids.

6. Combined Aggregate:

a. Aggregate gradations shall be determined during trial batch testing and shall be based upon the combined gradation and particle distribution in the mixture of coarse and fine aggregates.

b. Fine aggregate and coarse aggregate sizes specified shall be combined to produce a workable and cohesive concrete mix that is appropriate for its specific application. Coarse aggregate contents shall be based on Table 6.3.3 of ACI 211.1. Adjust the content required for pumping applications as specified in ACI 211.1.

c. The total quantity of fine aggregate shall be not more than forth-five percent (45%) nor less than thirty-two and one-half percent (32.5%) by weight of the total aggregate for normal weight concrete. Using a total quantity of fine aggregate which does not meet this specified range shall only be acceptable when approved by the Engineer. The total quantity of fine aggregate shall be not more than forty-five percent (45%) nor less than thirty-two and one-half percent (32.5%) by weight of the total aggregate for normal weight concrete. Using a total quantity of fine aggregate which does not meet this specified range shall only be acceptable when approved by the Engineer

d. Gradations of combined aggregate shall be plotted and submitted on:

1) A combined grading chart (percent passing versus sieve size).

2) An aggregate Particle Distribution Chart (percent retained versus sieve size).

7. Fine and coarse lightweight aggregates for lightweight concrete shall conform to ASTM C 330. Between twenty percent (20%) to thirty-five percent (35%) shall pass the No. 50 sieve and between ten percent (10%) to twenty percent (20%) shall pass the No. 100 sieve in the sand fraction gradation. Normal weight aggregate for lightweight concrete shall conform to ASTM C 33.

E. Concrete Admixtures

1. Provide admixtures produced by established reputable manufacturers, and use in compliance with the manufacturer's printed instructions. All admixtures shall be compatible and by a single manufacturer capable of providing qualified field service representation. Do not use admixtures which have not been incorporated and tested in the accepted mixes, unless otherwise authorized in writing by Engineer.

2. Air entraining admixtures shall conform to the NYS DOT Materials Bureau approved list and ASTM C 260.

3. Normal range or midrange water reducing admixture shall be in conformance with ASTM C 494 Type A, and comply with the NYS DOT Materials Bureau approved list.

4. High-Range Water Reducing Admixture:

a. High range water reducer shall conform to ASTM C 494, Type F or G and comply with the NYS DOT Materials Bureau approved list.

b. The high range water-reducing admixture shall be accurately measured and added at the batch plant facility. The Contractor may redose the concrete no more than two (2) times with the high range water reducer at the Site, provided that a calibrated dispenser system and containers of high range water reducer sealed and labeled by the manufacturer are used.

5. Set Controlling Admixture:

a. Set controlling admixture shall be either with or without water-reducing properties.

b. Where the air temperature at the time of placement is expected to be consistently over ninety (90) degrees Fahrenheit, a water-reducing set controlled admixture conforming to ASTM C 494, Type D and the NYS DOT Materials Bureau approved list.

c. Where the air temperature at the time of placement is expected to be consistently under forty (40) degrees Fahrenheit, except for mass concrete placement, a non-corrosive, non-chloride accelerator conforming to ASTM C 494, Type C and the NYS DOT Materials Bureau approved list shall be used.

6. Shrinkage Reducing Admixture:

a. A shrinkage-reducing admixture is permitted to be used in the mix design where necessary to meet specified shrinkage limitations provided that specified strength requirements are met and there is no reduction in sulfate resistance and no increase in permeability.

b. Shrinkage reducing admixtures shall be one of the following:

1) Eclipse, manufactured by GCP Applied Technologies (formerly Grace Construction Products).

2) MasterLife SRA 20 (formerly Tetraguard AS20), manufactured by BASF Construction Chemicals, LLC.

3) Sika Control-220, manufactured by Sika Corporation.

4) Eucon SRA-XT, manufactured by Euclid Chemical Co.

5) Or an approved equal.

7. Corrosion Inhibiting Admixture:

a. Corrosion inhibiting admixture shall be a calcium nitrite solution containing a minimum of thirty percent (30%) calcium nitrite and shall meet the requirements of ASTM C1582 and ASTM C 494 as a Type C admixture.

b. The quantity of mix water shall be adjusted to account for the water portion of the calcium nitrite solution.

c. As the calcium nitrite solution accelerates setting time, retarding admixtures shall be provided as needed, unless the admixture has been formulated to not accelerate setting.

d. Corrosion inhibiting admixture shall be one of the following:

1) DCI or DCI-S, manufactured by GCP Applied Technologies (formerly Grace Construction Products).

2) Rheocrete CNI, manufactured by BASF Construction Chemicals, LLC.

3) Sika CNI, manufactured by Sika Corporation.

4) Eucon CIA, manufactured by Euclid Chemical Company.

5) Or an approved equal.

8. Calcium chloride, admixtures containing thiocyanate, or admixtures containing more than 0.05 percent chloride ions shall not be used.

9. Crystalline Waterproofing, added crystalline based permeability reducing admixture. Crystalline waterproofing admixture use appropriate manufacturer's product for specific contract Work.

a. Crystalline waterproofing shall be one (1) of the following:

1) Eucon Vandex AM-10 manufactured by Euclid Chemical

2) Sika WT-215P manufactured by Sika Corporation

3) XYPEX Admix C-500 or C-1000, manufactured by XYPEX Chemical Company

4) Krystol Internal Membrane (KIM) manufactured by Kryton

5) Or an approved equal.

F. Water

1. Water for concrete, mortar, and grout shall be clean and free from objectionable mineral salts and from injurious amounts of oils, acids, alkalis, organic materials, or other substances that may be deleterious to concrete or steel. Water shall meet the requirements of ASTM C 94.

G. Bonding Agent

1. Provide a two component epoxy-resin bonding agent conforming to ASTM C 881.

2. Product and Manufacturer: Provide one of the following:

a. Sikadur 32, Hi-Mod LPL, as manufactured by Sika Corporation.

b. Eucopoxy LPL MV, as manufactured by the Euclid Chemical Company.

c. MasterEmaco ADH 327 (formerly Concressive Paste LPL), as manufactured by BASF Construction Chemicals.

d. Or an approved equal.

3. Provide three (3) component epoxy modified cementitious bonding agent where two (2) component bonding agent does not provide sufficient open time.

4. Product and Manufacturer: Provide one of the following:

a. Sika Armatec 110 EpoCem, as manufactured by Sika Corporation.

b. MasterEmaco P124 (formerly Emaco P24), as manufactured by BASF Construction Chemicals.

c. Or as approved equal.

5. All bonding agent shall be two component epoxy-resin type unless specifically noted otherwise in the Contract Documents.

H. Finishing Aids

1. Evaporation Retardant:

a. Evaporation retardant shall be a material which seals the surface of plastic concrete to prevent moisture loss. The material shall be able to be worked into the concrete surface by subsequent finishing operations with no adverse effect on finishing effort and no discoloration of the finished concrete.

b. Evaporation retardant shall be one of the following:

1) Confilm, as manufactured by BASF Construction Chemicals, LLC.

2) Eucobar, as manufactured by Euclid Chemical Company.

3) SikaFilm, as manufactured by Sika Corporation.

4) Or an approved equal.

I. Curing and Protection Materials

1. Absorptive covers shall consist of burlap cloth made from jute or kenaf, weighing approximately ten (10) ounces per square yard and complying with AASHTO M 182, Class 3.

2. Curing mats shall be heavy carpets or cotton mats, quilted at four (4) inches on center. Curing mats shall weigh a minimum of twelve (12) ounces per square yard when dry.

3. Moisture retaining covers shall conform to ASTM C 171 and consist of one of the following materials.

   a. Waterproof paper.

   b. Polyethylene film.

   c. White burlap polyethylene sheet.

4. Curing compounds shall conform to the requirements of ASTM C 309 Type 1-D (water retention requirements):

   a. Provide one of the following:

      1) Super Aqua Cure VOX, as manufactured by The Euclid Chemical Company.

      2) Sealtight 1100, as manufactured by W.R. Meadows, Inc.

      3) MasterKure, as manufactured by BASF Construction Chemicals, LLC.

      4) Or an approved equal.

   b. Provide fugitive dye unless waived by the Engineer.

5. Insulation Blankets:

   a. Closed cell flexible foam sheet material such as polystyrene or urethane. Foam sheet material which is capable of being bent ninety (90) degrees without breaking or tearing shall be provided at corners. The foam insulation blankets shall be one-half (1/2) inch thick.

   b. Quilted, flexible insulation blankets that retain their insulating value when wet and which retard the evaporation of water.

6. Temperature Monitoring Equipment:

   a. Thermocouples or thermistors shall be as manufactured by James Instruments Inc. or equal. They shall be suitable for embedment in concrete and capable of registering temperatures within the accuracy of one-half (0.5) degrees Fahrenheit over a minimum temperature range of twenty (20) to two-hundred (200) degrees Fahrenheit.

   b. Temperature monitoring and recording equipment shall consist of rechargeable battery-powered recording thermometers with microprocessors such as the IQT-Meter or the IQM-Meter as manufactured by James Instruments Inc. or equal. The equipment shall be capable of taking and recording temperature readings at each temperature sensor at preset time intervals. The thermometer units shall be

compatible with the temperature sensors used, shall have a non-volatile memory capacity of at least one-hundred and twenty (120) readings per sensor, and shall be designed to be connected to a battery-powered compatible printer unit. Time periods shall be able to be set over a minimum range of ten (10) to sixty (60) minutes. The thermometer unit shall be designed and constructed for construction conditions. Sufficient thermometer units shall be provided to take readings from all temperature sensors plus one additional backup unit for every ten units in service. One printer unit shall be provided for every twenty (20) thermometer units with sufficient paper supply to record all readings taken.

J. Crack Injection Materials

1. Epoxy:

a. Epoxy for injection shall be a low viscosity, high modulus moisture insensitive type.

b. Epoxies for injection shall be:

1) Sikadur 35, Hi-Mod L.V. and Sikadur 31, Hi-Mod Gel, as manufactured by Sika Corporation.

2) Eucopoxy Injection Resin, as manufactured by The Euclid Chemical Company.

3) MasterInject 1500, as manufactured by BASF Construction Chemicals.

4) Or an approved equal.

c. Viscosity of epoxy shall be as determined by the manufacturer and Engineer as appropriate for the crack size.

2. Hydrophilic Resin:

a. Hydrophilic resin shall be an acrylic-ester based resin with a maximum viscosity of fifty (50) cps. It shall cure into a flexible rubber-like material which has the potential for unrestrained increase in volume in excess of one-hundred percent (100%) in the presence of water.

b. Hydrophilic resins shall be:

1) Duroseal Inject, as manufactured by BBZ USA, Inc.

2) Gelacryl Superflex, and DeNeef Sealfoam PURe, as manufactured by GCP Applied Technologies (formerly Grace Construction Products).

3) AV-333 Injectaflex, as manufactured by Avanti International .

4) Or an approved equal.

K. Concrete Repair Materials

1. Concrete repair mortar shall be a prepackaged polymer-modified cementitious repair mortar with the following minimum properties:

   a. Compressive strength at one (1) day: 2000 psi (ASTM C 109).

   b. Compressive strength at twenty-eight (28) days: six-thousand (6000) psi (ASTM C 109).

   c. Bond strength at twenty-eight (28) days: eighteen-hundred (1800) psi (ASTM C 882 modified).

2. Concrete repair mortar shall be:

   a. Five Star Structural Concrete, manufactured by Five Star Products, Inc. The formulation recommended by the manufacturer for the specific application conditions shall be used.

   b. 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.

   c. Emaco S88-CI or S66-CI, manufactured by BASF Construction Chemicals, LLC. The formulation, among those listed, recommended by the manufacturer for the specific application conditions shall be used.

   d. Verticoat or Verticoat Supreme, manufactured by the Euclid Chemical Company. The formulation, among those listed, recommended by the manufacturer for the specific application conditions shall be used.

   e. Or approved equal.

3. Cement mortar shall consist of a mix of one (1) part cement to one and one-half (1 ½) parts sand with sufficient water to form a trowelable consistency. Minimum compressive strength at twenty-eight (28) days shall be four-thousand (4000) 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.

L. ADA Ramp Materials

1. Materials for ADA Ramp, detectable warning surfaces, and landings shall adhere to the latest requirements of PROWAG and NYCDOT Standard Specifications.

2.3 FABRICATION / ASSEMBLING / FINISHES

A. Proportioning and Mixing

1. Prepare concrete design mixes subject to the limitations listed in Table 1 and specified herein so as to create a homogeneous mix and a concrete which meets the specified strength requirements and, of equal importance, provides a concrete which is water tight and durable against deterioration and abrasion. The mix design shall produce a concrete of a consistency which can be placed so as to meet the required finished appearance. The minimum cement necessary to produce the required strength shall be used. This Section applies to concrete mixes using one-half (½) inch and larger nominal maximum aggregate. For mixes using smaller aggregate sizes, see Section 03 60 00 - Grouting. The mix design shall be submitted using the Mix Design Submittal Form at the end of this Section.

2. Air Content:

a. All concrete shall be air entrained unless indicated otherwise.

b. Air content for normal weight concrete shall be as follows:

NOMINAL MAXIMUM AGGREGATE SIZE (IN.)	Total Air Content, percent by Volume (+/- 1.5%)
1/2	7
3/4	6
1	6
1-1/2	5.5

3. Lightweight concrete shall contain six percent (6%) ± two percent (2%) total air when the nominal maximum size of coarse aggregate is greater than three-eighth (3/8) in., or seven percent (7%) ± two percent (2%) when the nominal maximum size is three-eighths (3/8) in. or less as determined in accordance with ASTM C173. Slump:

a. Slump for all concrete shall be three (3) inches +/- one (1) inch, unless indicated otherwise.

b. Where high range water reducing admixture is used, the specified water-cementitious material ratio shall be reduced by 0.02 and concrete shall be proportioned for no higher than three (3) inch slump. The slump after addition of the high range water reducing admixture shall not exceed eight (8) inches when measured at the point of placement.

c. A tolerance of up to two (2) inch above the maximum indicated slump shall be allowed for one batch in any five (5) consecutive batches tested provided that it can be demonstrated that the specified water-cementitious material ratio is not exceeded.

d. The slump of lightweight concrete for floors shall not exceed four (4) inch at the point of placement.

e. For troweled floors, the slump of structural lightweight concrete with one-hundred percent (100%) normal weight sand discharged by pump shall not exceed four (4) inch at the point of placement.

4. Shrinkage Limitation:

a. The maximum concrete shrinkage for specimens cast in the laboratory from the trial batch, as measured at twenty-one (21) day drying age or at twenty-eight (28) day drying age shall be 0.039 percent or 0.045 percent, respectively. The Contractor shall only use a mix design for construction that has first met the trial batch shrinkage requirements. Shrinkage limitations shall not apply to Class 25 concrete, unless indicated otherwise.

b. If the trial batch results fail to meet the shrinkage limitation, the mix shall be redesigned to reduce shrinkage. Alternately, the Contractor may use a higher shrinkage mix when acceptable to the Engineer, provided that the amount of shrinkage reinforcement in the structures is increased as determined by the Engineer to resist the higher levels of shrinkage stresses. The additional reinforcing shall be provided at the Contractor's expense.

5. The percentage of mortar in the concrete mix shall not exceed sixty percent (60%) for Class 50 and 45 concrete. Exceeding this specified mortar percentage shall only be acceptable when approved by the Engineer.

6. The unit weight limitations for lightweight concrete shall be as shown on the Contract Drawings.

7. Proportioning: Concrete proportions shall be determined in accordance with the provisions of Sections 1905.2.1 through 1905.2.3 of the NYCBC.

a. Proportions of materials for concrete shall be established to provide

1) The proportioning of ingredients shall produce a mixture that will provide workability and consistency to permit concrete to be worked readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the Work, but without permitting the materials to segregate or excessive bleeding. Yield of all mixes as designed shall not exceed 27.2 cu.ft./cu.yd.

2) Resistance to special exposures are required by NYCBC Section 1904 and ACI 350 06 Table 4.2.2.

3) Conformance with the strength test requirements of Sections 1905.6

b. Concrete is to meet the durability requirements of Section 1904 of NYCBC.

c. The determination of the concrete mix proportion to attain the required strength shall be in accordance with the procedure, as designated by the Sections in the schedule set forth therein and as specified herein. All mixes shall be approved by the Engineer prior to construction.

d. Where different materials are to be used for different portions of proposed Work, each combination shall be evaluated.

e. Concrete proportions shall be established in accordance with NYCBC Section 1905.3 or Section 1905.4, and shall comply with the applicable requirements of Section 1904.

    1) NYCBC Section 1905.3 - Proportioning on the basis of field experience/or trial mixtures. Concrete proportioning determined on the basis of field experience or trial mixtures shall be done in accordance with ACI 350, Section 5.3. If the required f'_c is obtained for trial batch mixed prior to the date specified, the trial mix design may be approved. All mixes shall be approved by the Engineer prior to construction.

    2) NYCBC Section 1905.4 - Proportioning without field experience. Concrete proportioning determined without field experience or trial mixtures shall be done in accordance with ACI 350, Section 5.4. This method of proportioning shall not be permitted for load-carrying structural concrete or concrete mix proportions that are required to conform to NYCBC Section 1904.

f. Proportioning on the basis of field experience and/or trial mixtures using a mix design employing the same ingredients proposed for use, and used successfully on a previous project, or projects, may be used provided the following are submitted by a licensed concrete testing laboratory and approved by the Design Engineer of record in conformance with NYCBC 1905.3 and ACI 350 Section 5.3.

    1) The name and location of the plant from which the concrete will be batched.

    2) The concrete mix design including detailed data and analysis of the ingredients proposed for use as specified herein. Concrete mix designs, including material source locations, both for the previous concrete proposed for consideration as similar for proportioning purposes and for the concrete proposed for this Project shall be submitted for Engineer consideration. Final determination of whether the proposed concrete mix is similar to a previous concrete mix is to be made by the Engineer.

    3) Reports for at least thirty (30) consecutive tests of seven (7) day and twenty-eight (28) day concrete strength tests of the proposed mix made during the previous twelve months of concrete batched and

delivered from the same plant that is to furnish this job. These data shall include an evaluation in accordance with ACI 214 to determine the average strengths, moving averages and the coefficients of variation. In addition, the results of a minimum of three (3) shrinkage tests for this mix made during the previous twelve months and using the same materials to be used on this Project.

4) Reports of compliance tests of fine and coarse aggregates made during the above tests.

g. Average strength reduction. As data becomes available during construction, it is permissible to reduce the amount by which the average compressive strength (f'_c) is required to exceed the specified value of f'_c in accordance with ACI 350, Section 5.5

h. Evaluation and acceptance of concrete. The criteria for evaluation and acceptance of concrete shall be as specified in NYCBC Sections 1905.6.3.3 through 1905.6.5.5 and this Section.

B. Qualified technicians. Concrete frequency and testing shall be tested in accordance with the requirements of NYCBC Section 1905.6.2 thru 1905.6.5.5. Qualified technician shall perform tests on fresh concrete at the Site, prepare specimens required for curing under field conditions, prepare specimens required for testing in the laboratory and record the temperature of the fresh concrete when preparing specimens for strength tests. All field sampling and testing, including the testing of aggregates, concrete mixes, and strength testing of specimens, shall be subject to special inspection by an approved testing agency. All testing laboratories shall be approved testing agencies and shall employ qualified special inspectors to perform all required laboratory tests. Test results shall be promptly distributed by the testing laboratory to the Engineer, concrete producer, DEP, and the Contractor.

C. ADA Ramp shall be constructed to the dimensions indicated in the Contract Drawings. Detectable Warning Surface, Landings, and other design elements shall comply with the latest information from PROWAG and the NYCDOT Standard specifications.

D. Flared End Sections shall be constructed per the dimension and materials detailed in the Contract Drawings. The joint or connection of the Flared End Section shall be formed so that end section can be installed or connected to the intended pipe.

2.4 SOURCE QUALITY CONTROL / SHOP TESTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION

A. Inspection

1. The Contractor and its installer shall examine the substrate and the conditions

under which Work is to be performed and notify Engineer in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

B. Preparation for Concrete

1. All reinforcement, installation of waterstop, positioning of embedded items, and condition of formwork shall be inspected and approved by the Engineer prior to concrete placement. Contractor shall provide written notice of intention to place concrete a minimum of one (1) working day prior to placement.

2. The Contractor shall provide the following preparation before placing of concrete.

a. Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.

b. Formwork shall have been completed in conformance with Section 03 10 00 - Concrete Forming and Accessories; ice and standing water shall have been removed; reinforcement shall have been secured in place in conformance with Section 03 21 00 - Reinforcing Steel; expansion joint material, anchors and other embedded items shall have been positioned. Concrete shall not be placed on frozen ground.

c. Subgrade shall be watered sufficiently to achieve surface saturated density of subgrade materials.

d. Soft spots in subgrade shall be removed and replaced with approved backfill materials.

e. No concrete shall be placed until the entire preparation has been approved by the Engineer or his authorized representative.

f. When high ambient temperatures necessitate protection of concrete immediately after placing or finishing, make provisions in advance of concrete placement for windbreaks, shading, fogging, sprinkling, ponding, or wet covering with a light colored material.

C. During cold weather, make provisions in advance of concrete placement to maintain the temperature of the concrete above fifty-five (55) ºF. Use heating, covering or other means adequate to maintain the required temperature without injury to concrete due to concentration of heat. Do not use combustion heaters during the first twenty-four (24) hours unless precautions are taken to prevent exposure of the concrete to exhaust gases containing carbon dioxide.

3.2 IMPLEMENTATION

A. Mixing and Transporting Concrete

1. General:

a. The Contractor shall provide the production of concrete which includes batching, mixing, delivering, and discharging of concrete according to the following requirements.

2. Ready-Mixed Concrete:

a. Ready-Mixed concrete shall be batched, mixed and transported in accordance with the appropriate sections of "Specifications for Ready-Mixed Concrete" (ASTM C 94 or ASTM C685). Follow the detailed recommendations given in Guide for Measuring, Mixing, Transporting, and Placing Concrete (ACI 304R), where applicable.

b. Each truck mixer or agitator shall have attached thereto in a prominent place a metal plate issued by the Truck Mixer's Manufacturer's Bureau by the manufacturer complying with Section 11.1.2 of ASTM C 94 for that truck mixer and the limitations thereon shall be strictly adhered to.

c. Ready-mixed concrete shall only be batched in plants which meet the following:

1) Concrete plants shall be certified by the National Ready Mixed Concrete Association (NRMCA) and shall comply with the rules of the department.

2) Upon written application by the producer, accompanied by a detailed report on how the facilities compare with the standards of the NRMCA, the above requirements may be waived, in writing by the Engineer.

3) If the detailed report mentioned above is issued by the testing agency which will perform the inspection of the batching and mixing of the concrete and indicates that satisfactory quality concrete can be produced by the plant in question, based on prior job performance records, then the above requirement will be waived, in writing, bythe Engineer.

d. Approval of plants as outlined above is subject to the continuous checking and acceptance by the Commissioner or his duly authorized representative.

e. Only plants meeting the requirements for certification of the NRMCA for automatic batching and automatic recording will be permitted.

1) If at any time automatic proportioning or recording instruments become inoperative, the plant may be allowed to batch concrete manually or operate with manual recording for a period of not more than forty-eight (48) working hours from the time of breakdown.

2) If at the end of forty-eight (48) working hours, the plant is still not in operating order, the following shall be complied with:

a) DEP shall be contacted and an independent inspector, other than the regular plant inspector shall be assigned to each batching operation at the plant, at no additional cost to the DEP.

b) Additional inspectors shall observe and record the weight of each component of the batch.

c) The manually recorded batch weights shall appear on a ticket presented to inspection personnel at the Project Site.

f. Concrete producers shall have their plants inspected quarterly by NYSDOT.

g. Concrete producers shall have their scales and trucks certified quarterly by NYSDOT.

3. Batch Mixing at Site:

a. The concrete shall be produced in a plant conforming to the requirements of the "Concrete Plant Standards" of the Concrete Plant Manufacturer's Bureau and ACI 318, Section 5.8.3. Prior to erection of such plant at the Site, the Contractor shall submit to the Engineer, for approval, all pertinent data relative to the plant.

b. All components of the plant must bear the proper rating plates issued by the Concrete Plant Manufacturers Bureau and the limitations thereon shall be strictly adhered to.

c. On job Site plants for jobs requiring less than one-thousand (1000) cubic yards of structural concrete or a job Site plant that would operate for less than thirty (30) working days duration, the requirements of Article 3.2 Paragraph A.2.e. for automatic batching and automatic recording will be waived. If at any time automatic proportioning devices or recording instruments become inoperative, follow the provisions of Article 3.2, Paragraphs A.2.e.1 and A.2.e.2.

d. The batch shall be so charged into mixer that some water will enter in advance of the cement and aggregates. Water shall continue to flow for a period which may extend to the end of the first twenty-five percent (25%) of the specified mixing time. Controls shall be provided to insure that the batch cannot be discharged until the required mixing time has elapsed. When concrete of normal weight is specified, controls shall be provided to insure that no additional water may be added during mixing. The entire batch shall be discharged before the mixer is recharged.

e. Each batch of two (2) cu.yd. or less shall be mixed for not less than one and one-half (1 ½) minutes. The mixing time shall be increased fifteen(15) seconds for each additional cubic yard or fraction thereof. Shorter mixing time may be permitted provided performance tests made in accordance with ASTM C 94 indicate that the time is sufficient to produce uniform concrete. At least three quarters of the required mixing time shall take place after the last of the mixing water has been added. The interior of the mixer shall be free of accumulations that will interfere with mixing action. Replace mixer blades when they have lost ten percent (10%) of their original weight.

f. When small quantities of concrete are produced on the Site, measure solid materials by weight, and liquid or paste materials by weight or by volume. Mix all materials in a mechanical mixer. If packaged dry combined materials are used, they shall conform to the requirements of ASTM C 387, and shall be capable of satisfying the requirements of this Standard Specification.

4. Control of Admixtures:

a. Air entraining and chemical admixtures shall be charged into the mixture as a solution and shall be dispensed by an automatic dispenser or similar measuring device. The accuracy of measurement of any admixture shall be within ±3 percent. Admixtures shall be charged into the mixer in such manner as not to come into direct contact with the cement.

b. Two (2) or more admixtures may be used in the same concrete provided such admixtures are added separately during the batching sequence and provided further that evidence is submitted to show that the admixtures used in that combination retain full efficiency and have no deleterious effect on the concrete or on the properties of each other.

c. All admixtures shall be added prior to mixing.

5. Structural Lightweight Concrete:

a. This section covers the requirements for production of structural lightweight concrete and appurtenances in structures. Portions of the structure to be treated as lightweight concrete under the provisions of this Section are so designated on the Contract Drawings. Lightweight concrete shall comply with all requirements of this Section unless otherwise specified in the Contract.

b. Performance and Design Requirements:

1) Entrain air in lightweight concrete that will be exposed to freezing and thawing conditions. Use 6 ±2 percent total air content when the nominal maximum size of aggregate is greater than three-eighths (3/8) inches. Use seven percent (7%) ± two percent (2%) total air content when the nominal maximum size is three-eighths (3/8) or less. Determine the air content by the volumetric methods of ASTM C 173. Select concrete mixture proportions for concrete to provide a compressive strength as required by the Contract Drawings.

2) Use ASTM C 150 Type II or Type V cement for lightweight concrete required to be chemical-resistant. Select concrete mixtureproportions to provide a specified minimum compressive strength four-thousand (4000) psi, unless otherwise specified on the Contract Drawings.

c. Mixtures:

1) Proportion lightweight concrete mixtures to meet the specified limit on maximum air-dry unit weight as determined by the method of ASTM C 567. Correlate the air-dry unit weight with the fresh unit weight of the same concrete to permit use of the latter as the basis for acceptance during construction.

2) Determine the cement factor needed to attain the required strength for lightweight concrete in accordance with the N.Y. City Administrative Building Code and relate strength to cement content of the concrete.

d. Batching and Mixing:

1) Batch and mix lightweight aggregate concrete as recommended by the aggregate producer and the concrete producer, and in accordance with this Section. If the procedure recommended by the aggregate producer and the concrete producer is at variance with this Section, submit the producers' recommendations to the Engineer for acceptance.

2) For low absorption aggregate, batch and mix aggregate that has been shown to absorb less than two percent (2%) water by weight during the first hour after inundation. Test aggregate for water absorption with the minimum moisture content likely to occur on the job. Pre-dampening may be used to achieve this condition.

3) For high absorption aggregate, batch and mix concrete made with lightweight aggregates absorbing two percent (2%) water by weight or more by:

a) First, add the aggregate to approximate eighty percent (80%) of the mixing water and mix for a minimum of one and one-half (1 ½) minutes in a stationary mixer or fifteen (15) revolutions at mixing speed in a truck mixer.

b) Then add any admixtures, the cement, and the withheld portion of mixing water and complete the mixing.

4) Additional water may be added to the mixture, if needed, to bring the mixture to the specified slump after truck transport. Increase the slump of concrete entering the pump as required to maintain the specified slump at the point of placement.

5) The lightweight aggregate shall be presoaked by vacuuming, ponding, or sprinkling continuously with water until the aggregate moisture content is sufficient to minimize slump loss through the pump line. Slump loss through the pump line shall not exceed four (4) inches. The presoaking period shall be up to thirty (30) days or as required by the Engineer after determination at the batch plant.

6. Tempering and Control of Mixing Water:

   a. Concrete shall be mixed only at the mix plants or at the job Site. Concrete shall be mixed in quantities not to exceed immediate job placement requirements.

   b. The addition of any water to the mix while the truck is en route from plant to job Site is strictly prohibited. Mixing in transit is strictly prohibited. Agitating in transit is permitted, but shall be kept to a minimum.

   c. When concrete arrives at the point of delivery with a slump below that which will result in the specified slump at the point of placement and is unsuitable for placing at that slump, the slump may be adjusted to the specified value by adding water if all the water required in the accepted mixture proportions has not been added at the start of mixing and if permitted by the Engineer. Addition of water shall be in accordance with ASTM C 94. Neither the specified water-cement ratio nor slump shall be exceeded. Do not make slump adjustments after fifteen percent (15%) of the batch has been unloaded. Do not add water to concrete containing a plasticizing or a high range water reducing admixture. Do not add water to concrete in delivery equipment not acceptable for mixing. Measure air content of air-entrained concrete, after slump adjustment, to verify compliance to specified requirements.

   d. Each increment of water added at the job Site must be incorporated by additional mixing by turning the drum not less than thirty (30) revolutions. The addition of the increments of water and the start of the mixing procedures shall not be commenced earlier than one-half (1/2) hour prior to the beginning of discharge. From the time the batch or load has been mixed to the specified slump, no further water shall be added to the concrete.

   e. Discharge of the concrete shall be completed within the limits set out in the following table. Time and drum revolution limits shall be measured from the introduction of any mixing water to the cement and aggregates or the introduction of the cement to the aggregates (ribbon loading).

CONCRETE DISCHARGE REQUIREMENTS	
CONCRETE TEMPERATURE	Limit
Over 90 degrees F	Concrete shall be removed from Site and discarded
85° to 90 degrees F	1 hour or 300 revolutions, whichever comes first
80° to 85 degrees F	1 hour 15 minutes or 300 revolutions, whichever comes first
70° to 80 degrees F	1 hour 30 minutes or 300 revolutions, whichever comes first
Below 70 degrees F	2 hours or 300 revolutions, whichever comes first

7. Weather Conditions:

   a. Cold Weather:

      1) To maintain the temperature of the concrete above the minimum placing temperature required by Article 3.02, Paragraph B.4.c, the as-mixed temperature shall not be less than fifty-five (55) degrees F when the mean temperature falls below forty (40) degrees F. Follow the detailed recommendations given in "Cold Weather Concreting" (ACI 306R), where applicable.

      2) If water or aggregate has been heated above one-hundred (100) degrees F, the water shall be combined with the aggregate in the mixer before cement is added. Cement shall not be added to mixtures of water and aggregate when the temperature of the mixture is greater than ninety (90) degrees F.

   b. Hot Weather:

      1) The ingredients shall be cooled before mixing if necessary to maintain the temperature of the concrete below the maximum placing temperature required by Article 3.02, Paragraph B.4.c. The temperature of the concrete at initial discharge shall not exceed eighty-five (85) degrees F. Follow the detailed recommendations given in "Hot Weather Concreting" (ACI 305R), where applicable.

   c. Under special circumstances, and with written approval of the Engineer, the above provisions as to the initial discharge temperature of the concrete may be modified.

   d. Accelerators or retarders may be used with the approval of the Engineer. When permitted, they shall be used in accordance with "Hot Weather Concreting" (ACI 305R).

8. Mixing Small Quantities of Concrete:

   a. Only when permitted by the Engineer, small quantities of concrete may be mixed either by a small manually controlled portable mixer or by hand. In such cases, volumetric measurement of aggregates will be permitted.

   b. Concrete shall be hand mixed on a watertight platform. Cement and aggregates shall first be mixed dry until a uniform color is obtained. Water shall then be added and the entire mass turned over at least six (6) times, or until the mixture is uniform and of the required consistency. Not more than one-half cubic yard of concrete shall be hand mixed in any batch.

B. Concrete Placement

CONTRACT GI-CONS-7
SECTION 03 30 00
CAST-IN-PLACE CONCRETE

1. General:

   a. The Contractor shall provide concrete placement including preparation before placing, conveying, depositing, consolidation, weather protection, bonding, underwater concreting, and placing of grout and mortar according to the following requirements.

2. Conveying:

   a. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is obtained. Follow the detailed recommendations given in "Guide for Measuring, Mixing, Transporting, and Placing Concrete" (ACI 304), where applicable.

   b. Conveying equipment shall be of size and design to insure a continuous flow of concrete at the delivery end and shall be approved. Conveying equipment and operations shall conform to the following requirements:

      1) Conveying equipment shall contain no aluminum components.

      2) Truck mixers, agitators, and non-agitating units and their manner of operation shall conform to the applicable requirements of Article 3.02.A.

      3) Belt conveyors shall be horizontal or at a slope which will not cause segregation or loss. Protect concrete to minimize drying and effects of temperature rise. Use an acceptable discharge hopper at the discharge end to prevent segregation. Do not allow mortar to adhere to the return length of the belt.

      4) Chutes shall be metal or metal-lined having rounded bottoms and shall have a slope not exceeding one (1) vertical to two (2) horizontal and not less than one (1) vertical to three (3) horizontal. Chutes more than twenty (20) feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

      5) Pump equipment shall be of suitable kind and adequate pumping capacity and shall be subject to approval by the Engineer. Placement shall be controlled so that segregation does not occur in the discharged concrete. Test cylinders for strength and tests for slump, temperature, and air content shall be made on samples of concrete taken at point of discharge from the pump line.

      6) The provisions of Article 3.02, Paragraph B.2.b.4 shall apply to placement methods delivering concrete through lines using pneumatic air pressure.

7) The provisions of Article 3.02, Paragraphs B.2.b.4 and B.2.b.5 are not applicable to gunned mortar applications.

3. Depositing:

a. Concrete shall be deposited continuously, or in lifts not to exceed eighteen (18) inches in thickness such that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located at points as provided for in the Contract Drawings or as approved. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior approval has been obtained. Detailed recommendations are given in "Guide for Measuring, Mixing, Transporting, and Placing Concrete" (ACI 304R), where applicable.

b. Placing of concrete in supported elements shall not be started until the concrete previously placed in columns and walls is no longer plastic and has been in place at least two (2) hours.

c. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to any procedure which will cause segregation.

d. Place concrete for beams, girders, brackets, column capitals, haunches, and drop panels at the same time as concrete for slabs.

e. When underwater placement is required or permitted, place concrete by a method acceptable to the Engineer. Deposit the fresh concrete so the concrete enters the mass of the previously placed concrete from within, displacing water with a minimum disturbance to the surface of the concrete.

f. Where a surface mortar is to be the basis of the finish, the coarse aggregate shall be worked back from the forms with a suitable tool so as to bring a full surface of mortar against the form, without the formation of excessive surface voids. All concrete shall be consolidated by internal vibration, spading, rodding, or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting or planes of weakness. Use internal vibrators of the largest size and power that can properly be used in the Work. Over-vibrating and use of vibrators to transport concrete within forms shall not be allowed. Vibrators shall be inserted and withdrawn at many points, approximately 18 in. apart. At each insertion, the duration shall be sufficient to consolidate the concrete but not sufficient to cause segregation, generally from five (5) to fifteen (15) sec. duration. A spare vibrator shall be kept on the job Site during all concrete

placing operations. Follow the detailed recommendations given in of ACI 309R, where applicable. Workers shall be experienced in use of the vibrators.

1) External vibration shall only be used when explicitly permitted by the Engineer. Vibrating operations shall be continuous throughout the entire section where concrete is being deposited. Vibrators shall be clamped to the studs or wales or in pairs so that while one is vibrating the other can be shifted to insure constant vibration. External vibration shall conform to the requirements of ACI 309R.

g. Execution:

1) Do not vibrate lightweight concrete to the point that large particles of aggregate float to the surface.

2) Do not work lightweight concrete to the point that mortar is driven down and an excess of the lightweight aggregate appears at the surface.

h. Self-Supporting Floors and Roofs:

1) Reinforced Concrete Beams and Girders shall be cast monolithically with adjoining arches.

2) Canopies, Cornices and Marquees shall be monolithically cast with floor arches, with profiles true to indicated contours. Top surfaces of canopies and marquees shall be pitched to drain. Exposed soffits and edges shall be rubbed with carborundum stone and left clean and true.

4. Protection, Weather, Placing and Preparation of Forms:

a. Concrete placed during rain, sleet or snow, or when the mean daily temperature falls below forty (40) degrees F or is expected to be below forty (40) degrees F during placing or within twenty-four (24) hours thereafter or rises above ninety (90) degrees F shall be adequately protected as provided in Article 3.02, Paragraph C. and approval for placement shall be obtained from the Engineer.

b. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish.

c. Placing temperature:

1) When the mean daily temperature falls below forty (40) degrees F, the minimum temperature of concrete as placed shall be fifty (50) degrees F. Follow the detailed recommendations given in “Cold Weather Concreting” (ACI 306R), and in accordance with NYCBC Section 1905.12, where applicable.

2) Concrete deposited in hot weather shall have a placing temperature which will not cause difficulty from loss of slump, flash set, or cold joints. The temperature of the concrete preferably should be less than eighty (80) degrees F and shall not exceed ninety (90) degrees F unless permitted by the Engineer. Loss of slump, flash set, or cold joints due to the temperature of the concrete as placed will not be acceptable. When the temperature of the steel is greater than one-hundred and twenty (120) degrees F, fog the steel forms and the reinforcement with water just prior to placing the concrete. Follow the detailed recommendations given in "Hot Weather Concreting" (ACI 305R) and in accordance with NYCBC Section 1905.13, where applicable.

d. Placing:

1) Adequate skilled personnel and equipment shall be available to handle and place the concrete immediately upon delivery.

2) Dry surfaces shall be wet down before commencing placement of concrete.

3) Temperature of surfaces to receive concrete (earth, forms, reinforcing steel, etc.), should approximate the temperature of the concrete being placed.

4) Evaporation rate of water from freshly placed concrete should be held to a minimum by:

a) Shading of operations.

b) Reducing air circulation in area of operations.

c) Maintaining fog spray during operations.

5) Cold Joints shall be avoided. This can be accomplished by:

a) Providing adequate skilled personnel to handle and place the concrete immediately after its delivery to the forms at an acceptable temperature.

b) Placing in layers thin enough and areas small enough so that vibration or working of the concrete will insure complete union of adjacent layers.

c) Lengthening of setting time by use of approved water reducing retarders.

d) Placing a bulkhead at a suitable point where placement is stopped temporarily.

6) Loss of slump shall be kept at a minimum. This can be accomplished by:

a) Minimum lapse of time between mixing and placing.

b) Avoiding delays in batch mixing and truck dispatching.

c) Job conditions and equipment (chutes, access runs, etc.) being organized to prevent additional mixing.

d) Use of approved water reducing retarders.

e. Preparation of forms:

1) All forms or surfaces (subgrades, reinforcing steel) to receive concrete, in addition to the normal requirements of tightness, soundness, being free of debris, etc., shall be:

a) Protected against excessive air currents.

b) Sprinkled systematically with cool water.

2) Note: Wetting down around the work will cool the surrounding air and increase the humidity, thus reducing temperatures and evaporation from the concrete.

5. Bonding:

a. When specified, the surface of joints shall be prepared in accordance with Section 03 32 00 – Joints in Concrete.

b. The hardened concrete of joints between footings and walls or columns, between walls or columns and beams or floors they support, joints in unexposed walls and all other not mentioned below shall be dampened (but not saturated) immediately prior to placing of fresh concrete.

c. The hardened concrete of horizontal construction joints in exposed work; horizontal construction joints in the middle of beams, girders or joints, and slabs; and horizontal construction joints in work designed to contain liquids shall be dampened (but not saturated) then thoroughly covered with a coat of neat cement mortar of similar proportions on vertical surfaces and at least one-half (1/2) inch thick on horizontal surfaces. The fresh concrete shall be placed before the mortar has attained its initial set.

d. Joints receiving an adhesive shall have been prepared and adhesive applied in accordance with the manufacturer’s recommendations prior to placing of fresh concrete.

e. Surfaces of joints which have been obtained by the use of a chemical retarder shall have been prepared in accordance with the manufacturer's recommendations prior to placing of fresh concrete.

6. Concreting Under Water:

a. Placing concrete in water will be permitted only when approved by the Engineer. Concrete deposited under water shall be carefully placed in a compacted mass in final position by means of a tremie, a closed bottom dump bucket or other approved means, and shall not be disturbed after being deposited. Special care must be exercised to maintain still water at the point of deposit. Concrete shall not be placed in running water. Underwater formwork shall be reasonably watertight. The consistency of the concrete shall be carefully regulated and special care shall be exercised to prevent segregation of materials. The method of depositing concrete shall be regulated to produce approximately horizontal surfaces.

b. When a tremie is used, it shall consist of a tube having a diameter of not less than ten (10) inches and constructed in sections having flanged couplings fitted with gaskets. The tremie shall be supported to permit free movement of the discharge end over the entire top surface of the work and shall permit rapid lowering when necessary to choke off or retard the flow. The discharge end shall be entirely sealed at all times and the tremie tube kept full to the bottom of the hopper. When a batch is dumped into the hopper, the tremie shall be slightly raised, but not out of the concrete at the bottom, until the batch discharges to the bottom of the hopper. The flow shall then be stopped by lowering the tremie. The flow shall be continuous until the pour has been completed.

c. When a bucket is used to place concrete in water, it shall have a capacity of not less than one-half (1/2) cubic yard.

7. Protection and Cleaning of Exposed Structural Steel:

a. The Contractor shall take all necessary precautions to prevent mortar and concrete splashes on the steel. The Contractor shall exercise care to prevent abrasion or scuffing of the paint on the structural steel while concrete is being formed, placed or stripped.

b. The Contractor shall thoroughly clean the structural steel of all concrete drippings or other foreign matter that may have been deposited on the steel or on any other part of the structure as a result of his operations. All the Work involved in thoroughly cleaning the steel shall proceed before concrete drippings have hardened. Immediately after the concrete has been placed, the Contractor shall clean the steel with water and/or such other additional means subject to the approval of the Engineer as may be necessary to remove all mortar, concrete and other foreign matter that has been dropped, dripped, splashed or otherwise deposited on the steel as a result of his operations. It will be the Contractor's obligation and responsibility to remove all foreign matter to the satisfaction of the Engineer.

c. After formwork has been removed, any concrete or other foreign material that may have been previously missed and that still remains on the steel shall be removed.

8. Concrete finishes shall conform to the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 03 35 00 - Concrete Finishing.

C. Concrete Curing and Protection

1. General:

a. Protect all freshly deposited concrete from premature drying, from weather elements, from defacement, from flowing water, and from mechanical injury. The concrete shall be maintained with minimal moisture loss at a relatively constant temperature for a period of time necessary for the hydration of the cement and proper hardening of the concrete in accordance with the requirements specified herein.

b. As soon as the concrete has been placed and horizontal top surfaces have received their required finish, provision shall be made for maintaining the concrete in a moist condition for at least a seven (7) day period thereafter except for high early strength concrete, for which the period shall be at least the first three days after placement. Horizontal surfaces shall be kept covered, and intermittent, localized drying will not be permitted.

c. Concrete curing shall be in accordance with NYCBC Section 1905.11.

2. Curing Methods:

a. The Contractor shall use one of the following methods to insure that the concrete remains in a moist condition for the minimum period stated above.

1) Ponding or continuous fogging or sprinkling.

2) Application of mats or fabric kept continuously wet.

3) Continuous application of steam (under one-hundred and fifty (150) degrees F).

4) Application of sheet materials conforming to ASTM C 171.

5) If approved by the Engineer, application of a curing compound in accordance with Article 3.02, Paragraph C.7.

6) High Early Strength concrete shall be maintained above fifty (50) degrees F and in a moist condition for at least the first three (3) days. Accelerated curing of concrete shall comply with ACI 318, Section 5.11.3.

3. The Contractor shall keep absorbent wood forms wet until they are removed. After form removal, the concrete shall be cured by one (1) of the methods in Article 3.2, Paragraph C.2.

4. Any of the curing procedures used in Article 3.2, Paragraph C.2 may be replaced by one (1) of the other curing procedures listed in Article 3.2, Paragraph C.2 after the concrete is one (1) day old. However, the concrete surface shall not be permitted to become dry at any time.

5. Curing Concrete under Cold Weather Conditions:

   a. Curing under cold weather conditions shall conform to the requirements of ACI 306.

   b. Stripping time for forms and supports shall be increased as necessary to allow for retardation in concrete strength caused by colder temperatures. This retardation is magnified when using concrete made with blended cements or containing fly ash or slag cement. Therefore, curing times and stripping times shall be further increased as necessary when using these types of concrete.

   c. The methods of protecting the concrete shall be approved by the Engineer and shall prevent local drying. Equipment and materials approved for this purpose shall be on the Site in sufficient quantity before the Work begins. The Contractor shall assist the Engineer by providing holes in the forms and the concrete in which thermometers can be placed to determine the adequacy of heating and protection. All such thermometers shall be furnished by the Contractor in quantity and type which the Engineer directs.

6. Curing Concrete under Hot Weather Conditions:

   a. When air temperatures exceed eighty-five (85)ºF, the Contractor shall take extra care in placing and finishing techniques to avoid formation of cold joints and plastic shrinkage cracking. If ordered by the Engineer, temporary sun shades and/or windbreakers shall be erected to guard against such developments, in addition to generous use of wet burlap coverings and fog sprays to prevent drying out of the exposed concrete surfaces.

   b. Curing and protection of the concrete shall begin immediately after completion of the finishing operation. Continuous moist-curing, consisting of methods listed in Article 3.2, Paragraph C.2.a.1 or C.2.a.2, is mandatory for at least the first twenty-four (24) hours. Method specified in Article 3.2, Paragraph C.2.a.2 . may be used only if the finished surface is not marred or blemished during contact with the coverings.

   c. At the end of the initial twenty-four (24) hour period, curing and protection of the concrete shall continue for at least four (4) additional days using one of the methods listed in Article 3.2, Paragraph C.2.

d. Curing procedures during hot weather conditions shall conform to the requirements of ACI 305.

7. Use of Curing Compound:

a. Curing compound shall not be used on surfaces to receive subsequent coatings. Curing compound shall not be used on surfaces exposed to water in potable water storage tanks and treatment plants unless curing compound is certified in accordance with ANSI/NSF Standard 61.

b. When permitted, the curing compound shall maintain the concrete in a moist condition for the required time period, and the subsequent appearance of the concrete surface shall not be affected.

c. The compound shall be applied in accordance with the manufacturer's recommendations after water sheen has disappeared from the concrete surface and after finishing operations. The rate of application shall not exceed three-hundred (300) square feet per gallon. For rough surfaces, apply in two (2) directions at right angles to each other.

8. Early Termination of Curing:

a. Moisture retention measures may be terminated earlier than the specified times only when at least one (1) of the following conditions is met:

1) The strength of the concrete reaches eight-five (85) percent of the specified twenty-eight (28) day compressive strength in laboratory-cured cylinders representative of the concrete in place, and the temperature of the in-place concrete has been constantly maintained at fifty (50) degrees Fahrenheit or higher.

2) The strength of concrete reaches the specified twenty-eight (28) day compressive strength as determined by accepted nondestructive methods or laboratory-cured cylinder test results.

3) Tests are made of cylinders kept adjacent to the structure and cured by the same methods and reach seventy percent (70%) of the specified compressive strength f'_c as determined in accordance with ASTM C 39.

9. Protection:

a. Floors which have received their final finish shall be closed to all traffic for at least forty-eight (48) hours following the completion of trowelling. Thereafter, before the floor is subjected to any traffic, it shall be covered with paper covering meeting the requirements of ASTM C 171. This protection shall be maintained as long as necessary to avoid damage to the floor.

b. During the curing period, and thereafter as conditions may require, the concrete shall be protected from damaging mechanical disturbances, particularly excessive load stresses, heavy shock, and excess vibration. All finished concrete surfaces shall be protected from damage caused by construction equipment, materials, or methods, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

c. Following removal of protective paper, the surface shall be protected from painting and other work. All stains shall be removed.

D. Concrete Repairs

1. Repair of Formed Surfaces:

a. The following defects shall be repaired in all types of formed finishes:

1) Spalls, air bubbles, rock pockets, form depressions, and other defects which are more than one-quarter (1/4) inch in depth.

2) Holes from tie rods and other form tie systems.

3) Fins, offsets and other projections which extend more than one-quarter (1/4) inch beyond the designated member surface.

4) Structural cracks, as defined by the Engineer.

5) Non-structural cracks, as defined by the Engineer, which are greater than 0.010 inches wide. In water retaining members, elevated slabs subject to rainfall and washdown, and below grade members, any crack which shows any amount of leakage. Where it is not possible to verify that a crack is not leaking, it shall be repaired.

6) Stains and substances marring the surface.

b. The following defects shall be repaired in smooth finish surfaces, in addition to those listed above:

1) Spalls, air bubbles, rock pockets, form depressions, and other defects which extend to more than one-half (1/2) inch width in any direction, no matter how deep.

2) Spalls, air bubbles, rock pockets, form depressions, and other defects of any size which exceed three (3) inch number in a twelve (12) inch square or twelve (12) inch number in a three (3) foot square.

3) Fins, offsets and other projections shall be completely removed and smoothed.

4) Scratches and gouges in the surface.

5) Surfaces that exceed allowable tolerances.

6) Texture and color irregularities. At water retaining surfaces, texture and color irregularities need not be repaired when greater than twelve (12) inches below the minimum normal operating water surface except where such defects are indicative of reduced durability.

c. Where a smooth rubbed or grout cleaned finish is specified, minor surface defects repairable by the finishing process need not be repaired prior to the finish application, when approved by the Engineer.

2. Method of Repair of Formed Surfaces:

a. Repair and patch defective areas with cement mortar or concrete repair mortar immediately after removal of forms and as directed by the Engineer.

b. Repairs made to water bearing and below grade surfaces shall be made with repair mortar only. Repairs of form tie holes in water bearing or buried surfaces shall be made with non-shrink grout as specified in Section 03 60 00 - Grouting.

c. Cut out honeycomb, rock pockets, voids, and holes left by tie rods and bolts, down to solid concrete but, in no case, to a depth of less than one (1) inch for cement mortar and one-half (1/2) inch for repair mortar. Make edges of cuts perpendicular to the 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 manufacturers recommendations. Compact mortar in place and strike off slightly higher than the surrounding surface. Cure as specified.

d. Repairs to surfaces exposed to public view shall match the color and texture of surrounding concrete.

e. Provide test areas at inconspicuous locations to verify mixture, texture and color match before proceeding with the patching.

f. Structural cracks shall be pressure grouted using epoxy injection in accordance with the manufacturer’s directions and recommendations. The Engineer shall determine whether cracks are structural or non-structural.

g. Non-structural cracks shall be pressure grouted using hydrophilic resin in accordance with the manufacturer’s directions and recommendations.

h. Fill holes extending through concrete by means of a plunger- type gun or other suitable device from the least exposed face, using a flush stop held at the exposed face to ensure completely filling.

i. Remove stains, grout accumulations, sealing compounds, and other substances marring surfaces by scrubbing, power washing, or abrasive blast using sand finer than No. 30 and air pressure from fifteen (15) to twenty-five (25) psi.

3. Repair of Unformed Surfaces:

a. Test unformed surfaces, such as monolithic slabs, for smoothness and to verify surface plane to the tolerances specified for each surface and finish according to ACI 117. Correct low and high areas as herein specified.

b. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having the required slope. Correct high and low areas as herein specified.

c. Repair finish of unformed surfaces that contain defects which adversely affect the durability of the concrete. Surface defects include crazing, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.

d. Repair structural cracks as defined by the Engineer in all structures.

e. Repair non-structural cracks as defined by the Engineer which are greater than 0.01 inches wide, which are in below grade structures, or which are exposed to public view. In water retaining structures, repair any crack which shows any amount of leakage and all cracks where leakage potential cannot be determined.

4. Methods of Repair of Unformed Surfaces:

a. Correct high areas in unformed surfaces by grinding, after the concrete has cured sufficiently so that repairs can be made without damage to adjacent areas.

b. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out the low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Where the concrete has already set and repairs are required, sawcut around the perimeter of the area to be repaired to a one-half (1/2) inch depth and remove concrete so that the minimum thickness of the repair is one-half (1/2) inch. Apply specified concrete repair mortar in accordance with the manufacturer's directions and recommendations.

c. Remove defective areas to sound concrete with clean, square cuts, to a minimum depth of one and one-half (1.5) inches. Provide three-quarter (3/4) inch clearance all around exposed reinforcing steel. Clean and dampen all concrete surfaces in contact with patching concrete and brush with the specified bonding agent. Place patching concrete while the bonding agent is still tacky. Mix patching concrete of the same materials and proportions to provide concrete of the same type or class and color as the adjacent finished concrete. Place, compact and finish as required to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

d. Repair isolated random non-structural cracks in members which are not below grade or water retaining, and single holes not over one (1) inch diameter, by the dry-pack method. Groove the top of cracks, and cut out holes to sound concrete and clean of dust, dirt and loose particles. Dampen all cleaned concrete surfaces and brush with the specified bonding agent. Place dry-pack grout before the cement grout takes its initial set. Mix dry-pack grout as specified in Section 03 60 00 - Grouting, Grout. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched areas continuously moist for not less than seventy-two (72) hours.

e. Structural cracks shall be pressure grouted using an epoxy injection system. Apply in accordance with the manufacturer's directions and recommendations.

f. Non-structural cracks in below grade and water retaining structures shall be pressure grouted using hydrophilic resin. Apply in accordance with the manufacturer's directions and recommendations.

g. Where flooring material is to be installed, assure that surface is acceptable for flooring material to be installed in accordance with manufacturer's recommendations.

5. Other Methods of Repair:

a. Repair methods not specified above may be used with written approval of the Engineer.

E. Shotcrete

1. Shotcrete is concrete or mortar pneumatically projected at high velocity onto a surface. Shotcrete proportioning, placement, curing and testing shall be in accordance with NYCBC Section 1913, where applicable.

2. For projects where NYCBC is not applicable, ACI 506 and 506.2 guidelines shall be followed.

3.3 FIELD TESTING / QUALITY CONTROL

A. Field Quality Control Testing:

1. General:

a. The use of these, or any, testing services shall in no way relieve the Contractor of his responsibility to furnish materials and construction in full compliance with the Contract Documents. The Contractor shall provide concrete of the quality specified

and Contractor must work with the Engineer and the DEP-designated Testing Laboratory and to keep himself fully informed of the Evaluation of the Compression Test results as described in Article 3.3 B.

2. Testing Provided by DEP – at DEP's discretion, the following testing and inspection shall be provided.

   a. Secure production samples of materials at plants or stockpiles during the course of the Work and test for compliance with the specifications

   b. Provide the services of a qualified concrete technician at each location on the job Site where concrete is being mixed and discharged from the mixer for the duration of the concrete placement.

   c. Strength Tests: The Concrete Testing Laboratory provided by DEP shall conduct all strength tests (in accordance with ASTM C39). Strength tests of the concrete shall be conducted in accordance with the following procedures.

      1) Secure composite samples in accordance with ASTM C 172.

      2) Each strength test shall be obtained from a different batch of concrete on a representative, truly random basis, avoiding any selection of the test batch other than by a number selected at random before commencement of concrete placement.

      3) Additional concrete test cylinders shall be made from concrete taken out of the bucket, hopper or forms as directed by the Engineer. These test cylinders shall be separate and distinct from those made from the mixer and shall be made from the same batch as the sample taken from the mixer. Where concrete is placed directly from the mixer into forms, without any intermediate conveyance, these additional cylinders will not be required.

      4) When pumping or pneumatic equipment is used, samples shall be taken at the discharge end.

      5) Compressive strength tests shall be conducted on a set of four (4) specimens molded from each sample in accordance with ASTM C 31, and cured under standard moisture and temperature conditions in accordance with ASTM C 31.

      6) A strength test shall be the average of the strength of two (2) six (6)-inch by twelve (12)-inch or three (3) four (4)-inch by eight (8)-inch cylinders made from the same sample of concrete in accordance with BC 1905.6.2.4 and ASTM C31.

7) Test two (2) specimens at seven (7) days in accordance with ASTM C 39. Test two (2) specimens at three (3) days instead of seven (7) days when high early strength is required.

8) Test three specimens at twenty-eight (28) days in accordance with ASTM C 39. The twenty-eight (28) day test result shall be the average of the strengths of the three specimens, except that if one specimen in a test manifests evidence of improper sampling, molding or testing, it shall be discarded and the remaining two strengths averaged. Should more than one specimen in a test show any of the above defects, the entire test shall be discarded. When high early strength is required, the specimens shall be tested at seven (7) days instead of twenty-eight (28) days.

9) When the seven (7) day test results (three (3) day for high early strength) are below sixty-five percent (65%) of the specified strength and/or whenever the twenty-eight (28) day test results (seven (7) day for high early strength) are below the specified strength, the specimens shall be kept intact and stored for a minimum of thirty (30) days or until inspected by both the Engineer or his authorized representative and the Contractor.

10) Written results of the compression test results shall be posted on the DEP's concrete database twenty-four (24) hours following the test date on the following business day. The test results are available to the Engineer, Contractor and concrete supplier. A hard copy of the final result will be sent to the Resident Engineer.

11) Unless otherwise directed, all cylinders shall only be handled by DEP designated personnel.

d. Other Required Tests:

1) Check the slump, air content, concrete temperature, unit weight, yield, and water content of each sample of concrete to be used in molding strength test specimens.

2) Perform all other field testing of concrete as required by the New York City Building Code.

3) Slump testing shall be conducted in accordance with ASTM C 143.

4) Air content testing shall be conducted in accordance with either ASTM C 231 (Pressure Method) or ASTM C 173 (Volumetric Method) on concrete samples from which the compressive strength test specimens are made. Note that the chase indicator is not the approved ASTM volumetric test method. Air content testing of lightweight concrete shall be in accordance with ASTM C 173.

5) Additional tests of air content shall be performed on a regular and frequent basis for control as directed by the Engineer. A Chase indicator, calibrated at least once daily against the readings for air content obtained by methods outlined in Article 3.3, Paragraph A.2.d.4, may be used for additional testing. Use of the Chase Indicator alone will not be considered as having met the requirements of Article 3.3, Paragraph A.2.d.1 for checking air content.

6) Measurements of concrete temperature shall be performed in accordance with ASTM C 1064.

7) Unit Weight tests shall be made with a calibrated one-half (1/2) cubic foot bucket in accordance with ASTM C 138. On obtaining the unit weight, the yield shall be immediately computed as the ratio; weight of all the ingredients batched including the water added per cubic yard (from the batching ticket) divided by the unit weight determined times twenty-seven (27). Over-yielding or under-yielding by more than two percent (2%) are cause for concern and should be immediately investigated.

8) Water content testing shall be conducted in accordance with AASHTO T 318.

9) Properly note and 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.

e. Frequency of Testing:

1) For buildings, make one strength test for each fifty (50) Cu. Yd. or fraction thereof for each mix design placed in any one day except that a minimum of two (2) tests will be made for each day's placement.

2) The minimum number of tests shown in the following table will be made for concrete used for all structures other than buildings.

Total Cubic Yards of Concrete Placed During Day	Minimum Number of Strength Tests
Up to one hundred (100)	One (1) for each fifty (50) Cu. Yds.*
OVER ONE-HUNDRED (100) CU. YDS.	One (1) for each one-hundred (100) Cu.Yds.*
*or fraction thereof	

4) The Engineer may require that additional tests be made.

f. Additional Services: The DEP provided testing agency shall provide additional services to the extent deemed necessary by DEP and shall also perform the following services.

1) Inspect concrete batching, mixing, and delivery operations in accordance with inspection requirements of the administrative building code of the City of New York.

2) Check batching and mixing operations.

3) Review the manufacturer's report of each shipment of cement, aggregates and reinforcing steel and/or conduct laboratory spot checks of these materials as received.

4) Inspect the location and dimension of the forms, the placing of the reinforcing steel and the placing, conveying and depositing of the concrete.

5) Sample concrete at point of placement and other locations directed by the Engineer and perform required tests.

6) Additional testing and inspection required because of changes in materials or mixture proportions requested by the Contractor. When required, such testing shall be performed at the Contractor's expense.

7) Additional testing of materials or concrete occasioned by failure to meet specification requirements. When required, such testing shall be performed at the Contractor's expense.

3. Authority and Duties of the DEP provided Special Inspection Testing Agency:

a. Special Inspections of concrete shall be in accordance with NYCBC Table 1704.4.

b. Technicians representing the testing agency shall inspect the materials and the manufacture of concrete and shall report their findings to the Engineer or his authorized representative and the Contractor.

c. When it appears that the material furnished or Work performed by the Contractor fails to fulfill specification requirements, the technician shall immediately notify the Engineer or his authorized representative, and the Contractor of such failure.

d. The technician shall not act as foreman or perform other duties for the Contractor.

e. Technicians are not authorized to revoke, alter, relax, enlarge or release any requirement of the specifications, nor to approve or accept any portion of the work.

4. Responsibilities and Duties of the Contractor:

a. Submit data and test documentation on materials and design mixtures including trial batch and shrinkage test results to the Engineer at least sixty (60) days prior to the start of field operations.

b. Submit to the Engineer the proposed procedures, methods, concrete mix designs, and the name and location of the particular concrete plant proposed for the Project. Submit the quality assurance programs of the concrete suppliers and provide copies of all test reports to the Engineer.

c. Provide all materials, labor and equipment necessary to assist the representatives of the DEP's testing agency in obtaining, preparing and handling test samples at the Project Site or at other sources of material. When directed by the Engineer, the Contractor shall be responsible for transferring strength test specimens from point of casting to curing boxes and/or to testing agency vehicles.

d. Advise the Resident Engineer and the DEP provided Testing Agency sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel.

e. Provide and maintain for the sole use of the testing agency adequate facilities for safe storage and proper curing of concrete test cylinders on the Project Site for the first twenty-four (24) hours, as required by ASTM C 31. The Contractor shall provide an insulated box of substantial construction for use in storing cylinders on the Site until such time as they are transported to the testing laboratory. The box shall be large enough to accommodate the maximum number of test cylinders which may be required for any day's concrete placement, and shall have an insulated hinged cover. Heating facilities shall be installed in the box such that the temperature within the box may be maintained at the limits specified by ASTM C 31. The box shall be of such dimensions as to permit placing the cylinders in the box one (1) high only. No stacking of cylinders will be permitted. A high-low thermometer shall be placed in the storage box and the maximum and minimum temperatures noted shall be recorded on an appropriate identification card for each test. To minimize the hazard of disturbance during curing, the storage box shall be located in an area free from vibration such as pile driving and traffic of all kinds. No concrete shall be delivered on the Site until such storage curing box has been provided and any identified problems with the box addressed to the satisfaction of the Engineer. Cylinders shall remain in the curing box until ready for delivery to the testing laboratory but not less than 24 hours. Sufficient box storage capacity shall be provided by the Contractor to allow for up to seventy-two (72) hours of cylinder storage.

f. The DEP provided Testing Agency shall deliver concrete test cylinders to the DEP designated testing laboratory, or such other location as designated in the Contract.

   Delivery methods shall be in accordance with the requirements of ASTM C 31. Deliveries shall be made such that cylinders remain at the job Site (in the boxes provided for their storage) no less than twenty-four (24) hours and no more than seventy-two (72) hours after the casting.

g. The Contractor shall furnish copies of mill test reports of all shipments of cement, aggregates and reinforcing steel being used to Engineer and the testing agency.

h. The Contractor shall be responsible for:

1) All testing associated with the evaluation proposed mix designs including required trial batch and shrinkage testing.

2) Establishing and controlling the mix proportions during the entire progress of the Work in accordance with Article 2.2, Paragraph E.

3) Testing required because of changes in materials or proportions of the mix requested by the Contractor, as well as, any extra testing of concrete or materials occasioned by failure to meet specification requirements.

D. Evaluation of Concrete Quality:

2. General:

a. Concrete quality shall include but not be limited to satisfactory strength, durability, density (air entrainment), wearing quality, shrinkage cracks, color, physical appearance etc.

b. Wherever there is evidence that any of the concrete in place does not appear to produce the results required by the specifications, such concrete shall be considered questionable and evaluations shall be made as detailed below.

3. Evaluation of Compressive Test Results:

a. Test results shall be evaluated separately, for each type and each specified strength of concrete. Evaluation shall be in accordance with the ACI 214.

b. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:

1) Every arithmetic average of any three consecutive compressive strength tests equals or exceeds the specified compressive strength f'c.

2) No individual strength test (average of two (2) six-inch by twelve-inch (6 by 12) or three (3) four-inch by eight-inch (4 by 8) cylinders) falls below the specified compressive strength f'c by more than five-hundred (500) psi when f'c is five-thousand (5,000) psi or less, or by more than 0.10 f'c when f'c is more than five-thousand (5,000) psi.

The strength level of the concrete will be considered satisfactory as long as the averages of all sets of three consecutive compressive strength test results equal or exceed the specified compressive strength f'c and no individual strength test result falls below the specified compressive strength f'c by more than five-hundred (500) psi.

c. For evaluation of the control of the quality and uniformity, each type and specified strength of the concrete shall be represented by at least five (5) tests.

d. If results of a number of consecutive seven (7) day tests at any stage of the work indicate abnormalities or results of a number of twenty-eight (28) day tests are below the specified strengths, the production and testing of the concrete shall be immediately investigated and reported upon by the Evaluation Committee noted in Article 3.3, Paragraph B.5. It is emphasized that the report of the Evaluation Committee is advisory. The responsibility for the production of the concrete and the decision as to how to proceed with the Work remain with the Contractor. However, the decision as to how to proceed is subject to review and approval by the Commissioner.

4. Evaluation of Questionable In-Place Concrete Construction by Nondestructive Methods:

a. Visual inspection, impact hammers, sonoscopes, microscopic examination, chemical analysis of the hardened concrete, probes or other nondestructive testing devices may be used as an indicator of the relative quality and uniformity of various areas of the structure, as an aide in evaluating concrete in place, or in determining locations of areas to be cored. Any program of nondestructive testing shall be performed as directed by and under the supervision of the Evaluation Committee noted in Article 3.3, Paragraph B.5. Test results of any program of nondestructive testing and recommendations based thereon shall be reported by the Committee to the Commissioner prior to the commencement of any other program of further testing, if recommended or required. All viewpoints if there is no complete agreement, shall be noted in the report.

b. Nondestructive Tests:

1) Test results shall be evaluated and shall be valid only if tests have been conducted by properly calibrated equipment in accordance with recognized standard procedures.

2) Nondestructive tests shall not be used as the sole basis for accepting or rejecting concrete.

5. Evaluation of Questionable In-Place Concrete Construction from Core Tests:

a. Core tests shall be conducted only as recommended and directed by the Evaluation Committee noted in Article 3.3,Paragraph B.5 and only after a program of nondestructive testing as noted in Article 3.3,Paragraph B.3. Core tests shall be

evaluated and shall be valid only if tests have been conducted in accordance with specified procedures.

b. When core testing is required, cores shall be obtained and tested in accordance with ASTM C 42. Cores shall be tested saturated-surface-dry or shall be tested air-dry depending as to whether the area where the questionable concrete is located shall be wet or dry under service conditions. Such determination shall be made by the Committee and they shall direct the condition of the cores at the time of testing. If the cores are to be tested dry, they shall be air dried (temperature sixty (60) to seventy (70) degrees F and relative humidity less than sixty percent (60%)) for seven (7) days before the test. If the cores are to be tested wet, they shall be tested after moisture conditioning in accordance with ASTM C 42. The laboratory report shall state whether the cores were tested saturated-surface-dry or surface-dry.

c. At least three (3) representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores will be determined by the Committee so as to least impair the strength of the structure.

d. If, before testing, one (1) or more of the cores shows evidence of having been damaged subsequent to or during removal from the structure, or is obviously defective, replacement cores shall be taken.

e. Concrete in the area represented by a core test, made and tested in accordance with the specified requirements above will be considered adequate for structural strength if the average strength of the three cores taken from the immediate area of the questionable concrete is equal to or greater than the specified strength and no single core strength is less than eighty-five percent (85%) of the specified strength (f'c).

f. The Committee shall determine the area where the cores are to be taken and they shall determine the number of cores to demonstrate the adequacy of the questionable concrete. Corrections to the strength values shall be made if the length to the diameter ratio is different from two (2). No strength correction shall be made for the age of the concrete cores.

g. If the average strength of the cores as tested is less than the required value, the Committee will make a recommendation as to whether the values obtained are acceptable or they will recommend that the values obtained be checked against a structural analysis as covered in Paragraph 3.3 C.

h. Core holes shall be plugged solid as specified by the Engineer.

6. Evaluation Committee:

a. The following shall constitute a Committee for the investigation and the evaluation of the quality of the concrete when there are indications that the requirements of Paragraph 3.3 B are not being met. The Resident Engineer (who shall act as Chairman of the Committee), the Engineer or authorized representative, representatives of the Contractor, the Concrete Producer, the Testing Agency, the

Architect/Engineer responsible for the design and such other members as the Commissioner may designate. Such members of the Committee as designated by the Chairman shall meet whenever request for such meeting is made by any member and/or as otherwise specified. Reports and recommendations of the Committee shall be submitted to the Contractor and the Commissioner. All viewpoints, if there is no complete agreement shall be noted in the report and reports shall be countersigned by all participating members of the Committee. The Contractor shall be responsible for the preparation and submission of reports.

b. The functions of the Committee and any reports, recommendations, etc., it submits shall be advisory in nature. The responsibility for the production and quality of the concrete remains solely and completely with the Contractor.

c. All expenses incurred due to the functioning of the Committee shall be borne by the Contractor except that all members of the Committee shall serve without fee.

7. Additional Curing:

a. If the concrete fails to meet the specified compressive strength requirement, additional curing as specified by the Engineer may be required and modifications may be required in the concrete mix design for the remaining concrete work, at the expense of the Contractor, in addition to the measures outlined in Article 3.3, Paragraph B.

8. Acceptance of Concrete:

a. Concrete Strength:

1) Concrete not meeting the requirements of Article 3.3, Paragraph B.2 shall be considered potentially deficient. Steps shall be taken to increase the strength to ensure that the strength level will be satisfactory. For potentially deficient concrete, see Article 3.03, Paragraph C.

b. Air Content:

1) Concrete not within the specified limits of air entrainment and tested in accordance with Article 3.3, Paragraph B shall be rejected.

2) Steps must be made to control the proper air content.

c. Slump:

1) Concrete not within the specified slump limits at the point of placement may be rejected.

2) When the concrete is tested and found to be out of specifications the Contractor shall immediately adjust the mix to bring the mixture within the specified slump limits.

d. Acceptance of lightweight concrete shall be based on fresh unit weight measured in accordance with ASTM C 138. The nominal fresh unit weight shall be that corresponding to the specified maximum air-dry unit weight calculated from the formula for approximate air-dry weight in ASTM C 567. When the nominal fresh unit weight varies by more than two (2) lb./cu. ft. from the required weight, adjust the mixture as promptly as conditions permit to bring the unit weight to the desired level. Do not use any batch for which fresh unit weight varies by more than three (3) lb./cu. ft. from the desired level.

E. Acceptance of Structure:

2. General:

a. Notwithstanding the provisions herein, all concrete shall conform to the requirements of the New York City Building Code.

b. Completed concrete work which meets all applicable requirements will be accepted without qualification.

c. Completed Concrete work which fails to meet one or more requirements shall be considered potentially deficient. Potentially deficient concrete which has been repaired to bring it into compliance will be accepted without qualification. The decision as to whether it has been brought into compliance except as otherwise noted in this Section shall rest with the Supervising Engineer for Inspection subject to approval of the Commissioner and the Building Department.

d. Potentially deficient concrete which cannot be brought into compliance shall be evaluated by the Committee noted in Article 3.3, Paragraph B and a report submitted to the Commissioner. The Commissioner will then, in writing, either accept without qualification or accept subject to Retainage (as outlined in Article 3.3, Paragraph .C.8) or direct that the concrete be reinforced or supplemented with additional construction to bring it into compliance after which it may be resubmitted to the Commissioner.

e. Repair potentially deficient concrete work by removing and replacing or by reinforcing with additional construction as required by the Engineer. To bring the rejected work into compliance, use repair methods that will maintain the strength of the structure and meet all other applicable requirements for function, durability, dimensional tolerances, and appearance.

f. Obtain acceptance by the Engineer for repair methods and materials and for modifications needed to ensure that concrete work complies with requirements in the Contract Documents.

g. The Contractor shall pay all costs incurred including redesign and reverification in bringing the concrete work into compliance and acceptance.

3. Dimensional Tolerances:

a. Formed surfaces resulting in concrete outlines smaller than required by an amount exceeding the requirements of Section 3.3 of ACI 347R shall be considered deficient in strength and subject to the provisions of Article 3.3, Paragraph C.4.

b. Formed surfaces resulting in concrete outlines larger than required, by an amount exceeding the requirements of Section 3.3 of ACI 347R may be rejected and the excess material shall be subject to removal. If removal of the excess material is permitted, it shall be accomplished in such a manner as to maintain the strength of the section and to meet all other applicable requirements of function and appearance.

c. Concrete members cast in the wrong location may be rejected if the strength, appearance or function of the structure is adversely affected or misplaced items interfere with other construction.

d. Inaccurately formed concrete surfaces exceeding the requirements of Section 3.3 ACI 347R and which are exposed to view may be rejected and shall be repaired or removed and replaced if required.

4. Appearance:

a. Concrete exposed to view with defects which adversely affect the appearance of the specified finish may be repaired, if possible. If, in the opinion of the Engineer, the defects cannot be repaired, the concrete shall be considered potentially deficient, such concrete shall be evaluated by the Committee noted in Article 3.3.B and a report submitted to the Commissioner. The Commissioner will then in writing, either accept without qualification or accept subject to Retainage (as outlined in Article 3.3, Paragraph C.8) or direct that other remedial measures be taken after which it may be resubmitted to the Commissioner.

5. Strength of Structure:

a. The strength of the structure in place will be considered potentially deficient if it fails to comply with any requirements which control the strength of the structure, including but not necessarily limited to the following conditions:

1) Low concrete compression test strength as evaluated by Article 3.3, Paragraph B above. However, in those areas or members containing such concrete, if a structural analysis by the architect/engineer indicates the completed structure will be suitable for its intended use, i.e., that the stresses which will be developed under design load in the members containing below-strength concrete are less than the design stress permitted for the actual compression test strengths reported and the analysis is approved by the Building Department, the member or members will be accepted without qualification.

2) Low concrete core tests as evaluated by Article 3.3, Paragraph B above. However, in those areas or members where core tests are made in accordance with Article 3.3, Paragraph B.4, if a structural analysis

by the architect/engineer indicates the suitability of the structure for its intended use, i.e., that the stresses which will be developed under design load in the members containing below-strength concrete are less than the design stress permitted for the actual core test strengths reported, and the analysis is approved by the Building Department, the areas or members will be accepted without qualification.

3) Reinforcing steel size, quantity, strength, position or arrangement at variance with the specified requirements or the Contract Drawings.

4) Concrete which differs from the required dimensions or location in such a manner as to reduce the strength.

5) Curing less than specified.

6) Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.

7) Mechanical injury, construction fires, accidents or premature removal of formwork likely to result in deficient strength.

8) Poor workmanship likely to result in deficient strength.

6. Action Required When Strength Is Potentially Deficient:

a. When the strength of the structure is considered potentially deficient, the following actions may be required by the Engineer/Architect:

1) Structural analysis or additional testing or both may be required.

2) Core tests may be required.

3) If testing is inconclusive or impractical or if structural analysis does not confirm the Safety of the structure, load tests may be required and their results evaluated in accordance with ACI 318.

4) Concrete Work rejected by structural analysis or by results of a load test shall be reinforced with additional construction as required by the Engineer/Architect, or replaced.

5) Document all repair work performed to bring strength-deficient concrete work into compliance with Contract Documents, and submit the documentation to the Engineer/Architect for acceptance.

7. Durability:

a. The durability of the concrete work will be considered deficient and therefore the concrete work shall be rejected, if it fails to comply with any of the requirements

which control the durability of the structure, including, but not necessarily limited to, the following conditions:

1) Strength failing to comply with Article 3.3, Paragraph B above.

2) Materials for concrete not conforming with the specified requirements of Article 3.3, Paragraph C.2. above.

3) Concrete not conforming with either the specified air-entrainment requirements or the air content limits.

4) Curing not accomplished in accordance with Contract Documents.

5) Inadequate protection of concrete from extremes of temperature during early stages of hardening and strength development.

8. Withholding:

a. Where concrete is placed which is considered to be deficient, whether in strength, appearance, durability or any other quality defined, payment may be withheld at the discretion of the Engineer. If such concrete is subsequently accepted without qualification, then payment shall be made for such concrete including return of all monies withheld.

9. Retainage:

a. Deficient concrete which cannot be brought into compliance and is nevertheless accepted by the Commissioner shall be subject to the following permanent retainage. For every cubic yard of concrete so placed, an amount equal to ten percent (10%) of the unit price for concrete in place for unit price contracts or ten percent (10%) of the price established in the detailed estimate for concrete in place for lump sum contracts shall be permanently retained.

10. Rejected Concrete:

a. Concrete which has been rejected, in writing, by the Commissioner, shall be removed and replaced. The cost of all such removed and replaced concrete shall be borne by the Contractor.

11. Protection of In-Place Concrete:

a. Loading and Support of Concrete:

1) Do not allow construction loads to exceed the superimposed load which the member, with necessary supplemental support, is capable of carrying safely and without damage. Submit for acceptance data on the amount of loading, method of distributing load, and any proposed supplemental support during construction.

b. Protection from Mechanical Injury:

1) During the curing period, protect, the Contractor shall protect the concrete and its shoring from damaging mechanical equipment inducing shock and vibrations at all times. Protect all concrete surfaces from damage by construction traffic, equipment, materials, rain or running water, and other adverse weather conditions.

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP (NOT USED)

"Table 1 -- Concrete Mix Requirements" is given on the following page

CONTRACT GI-CONS-7
SECTION 03 30 00
CAST-IN-PLACE CONCRETE

TABLE 1 – CONCRETE MIX REQUIREMENTS									
Classes of Concrete	Coarse Aggregate Sizes[2] (ASTM C 33)			Minimum Cementitious Material (lb/cu yd)	Cement Type (ASTM C150)	Mineral Admixture s[1] (%)		Maximum Water/ Cementitious Materials Ratio W/(C+ P)	Specific Strength (psi)	
	A	B	C			A	B		f'_c minimum field condition	f_{cr} minimum for mix design
50	#67 (3/4"to No. 4)	#8	---	705	III	CL. F (20 %)	GR .100 40%	0.40	**5,000 AT 28 DAYS**	6,500 at 28 days
45	#57 (1" to No. 4)	#8	---	660	II	CL. F (20 %)	GR .100 40%	0.40	5,000 at 28 days	6,500 at 28 days
25	#57 to #67	---	---	376	II	CL. F (20 %)	GR .100 40%	0.60	2,500 at 28 days	3,250 at 28 days

[1] Mineral admixtures (pozzolans) shall be substituted for cement by weight at the percentages indicated of the total weight of cementitious materials. Only one (1) pozzolan will be approved per mix. Either fly ash (A) or slag cement (B) may be used.

[2] Coarse aggregate listed in column A is the primary coarse aggregate and shall be used for all concrete classes. Stone sizes in columns B and C may be blended with primary size A aggregate to meet the combined aggregate gradation requirements defined in Article 2.2.D.6. Concrete containing primary coarse aggregate smaller than #67 shall only be used with the approval of the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 30 00
CAST-IN-PLACE CONCRETE

NO TEXT ON THIS PAGE

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SECTION 03 30 00
CAST-IN-PLACE CONCRETE

ATTACHMENT 03300 - CONCRETE PLACEMENT CARD

Contract:	Contractor:		
Placement Date: Concrete Mix:			
Scheduled Start Time: Approximate Quantity: cu. yds.			
Identification of Placement: Placement No:			
Item	Initials Inspector	Date	Remarks
Foundations			
Construction Joint Preparation			
Forms and Blockouts			
Waterstops			
Reinforcement			
Embedments/Anchor Bolts			
Piping/Test			
Temperature Checkout			
Cleanup			
Provisions for Weather			
Contractor			
Electrical Contractor			
HVAC Contractor			
Plumbing Contractor			
Structures Contractor			

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SECTION 03 30 00
CAST-IN-PLACE CONCRETE

NO TEXT ON THIS PAGE

Mix Design
Proportions Summary Sheet
MDS

- Use One Form Per Mix Design -

Contract:	Mix Design Code (DEP Only):	Class (Specified Strength): PSI + %	Proposed Trial Batch Date:	Submittal Date:
Contractor:	Concrete Supplier:		Testing Laboratory:	
Mix Description (Common Name):	Concrete Supplier Address:		Testing Laboratory Address:	
	City: / State: / Postal Code:		City: / State: / Postal Code:	

Expedite:	Application:	Field Inspection:	Weight Type:	Fly Ash:	Field Curing:
☐ Yes (Comment Reqd.)	☐ Structural ☐ Non-structural	☐ Yes (Controlled) ☐ No	☐ Normal ☐ Lightweight	☐ Yes, List %: ☐ No	☐ Yes, Min. Days: ☐ No

Specimen Transport, Testing & Disposal Ages (Use Comments Area, If Applicable):	No. of Specimens (Per Set)	Transport Age (Days)	Test Age (No. of Specimens at Days)						Disposal Age for Unused Specimens (Days)
			Preliminary		Final		Other(s)		
			Qty	Days	Qty	Days	Qty	Days	
☐ Yes ☐ No CQAP	5	2	2	7	3	28	-	-	28
☐ Yes ☐ No Other:									

Cement /Slag /Fly Ash		
Grade/Class:	Source:	PCY:
Cement/Slag /Fly Ash		
Grade/Class:	Source:	PCY:
Crushed Stone		
Size Number:	Source:	PCY (SSD):
Crushed Stone		
Size Number:	Source:	PCY (SSD):
Sand		
Type:	Source:	FM: / PCY (SSD):
Water		

			PCY:	GAL/CY:
Air Entraining Admixture				
Designation:		Brand:		OZ/CY:
_____-Range Water Reducing Agent				
Designation:		Brand:		OZ/CY:
Water-Reducing/Retarding Agent				
Designation:		Brand:		OZ/CY:
Other Admixtures				
Designation:		Brand:		OZ/CY:
Designation:		Brand:		OZ/CY:
Designation:		Brand:		OZ/CY:
Specified Slump (IN):	Specified Air Content (%):	Yield (CY):	Theoretical Unit Weight (PCF):	Water-Cement Ratio (from trial batch):
Comments:				
- Submit To NYCDEP CQAP At 1-800-673-2816 -				
Submitted By (Print):	Testing Laboratory:	Signature:		Date:

Mix Design
Submittal of Proportions
MDS

Contract:	Mix Design Code (DEP Only):	Class (Specified Strength): PSI + %	Proposed Trial Batch Date:	Submittal Date:
Contractor:	Concrete Supplier:		Testing Laboratory:	

Cement (ASTM C150)					
Type:	Sp. Gr.:	Class/Grade:	Source:	Total Mass Per CY (PCY):	Volume (CU FT):

Other Cementitious Materials (ASTM C18)					
Type:	Sp. Gr.:	Class/Grade:	Source:	Total Mass Per CY (PCY):	Volume (CU FT):

Aggregate No. 1, Fine (ASTM C33)					
Type:	SSD Sp. Gr.:	Size:	Source:	Total Mass Per CY (PCY):	Volume (CU FT):
Dry Rodded Unit WT (PCF):		Absorption (%):		FM:	

Aggregate No. 2, Coarse (ASTM C33)					
Type:	SSD Sp. Gr.:	Size:	Source:	Total Mass Per CY (PCY):	Volume (CU FT):
Dry Rodded Unit WT (PCF):		Absorption (%):			

Aggregate No. 3, 4 Coarse (ASTM C33)					
Type:	SSD Sp. Gr.:	Size:	Source:	Total Mass Per CY (PCY):	Volume (CU FT):
Dry Rodded Unit WT (PCF):		Absorption (%):			

Aggregate No. 2, Lightweight Alternative (ASTM C330)					
Type:	Sp. Gr. Factor:	Size:	Source:	Oven Dry (PCY):	Volume (CU FT):
Loose Unit WT (PCF):		Estimated Wet (PCF):			

Chemical Admixtures (OZ/CY)				
No. 1 ASTM C:	Type:	Source:	Name:	WT (OZ):
No. 2 ASTM C:	Type:	Source:	Name:	WT (OZ):
No. 3 ASTM C:	Type:	Source:	Name:	WT (OZ):

Water (Total)			Air Content		Total Mixture Mass and Volume	
GAL:	PCY:	CU FT:	%:	CU FT:	LB/CU FT:	CU FT:

Comments:

Submitted By (Print): Company: Signature: Date:

Mix Design
Aggregates Gradation
MDS

Sieve Size	Percent Passing Aggregate No.								
	1 (Fine)		2 (Coarse) Stone Size		3 (Coarse) Stone Size		4 (Coarse) Stone Size		Combined Gradation
	Per ASTM C33:	Tested:	Per ASTM C33:	Tested:	Per ASTM C33:	Tested:	Per ASTM C33:	Tested:	
3 IN									
2 1/2 IN									
2 IN									
1 1/2 IN									
1 IN	-								
3/4 IN	-								
1/2 IN	-								
3/8 IN	100								
1/4 IN	-								
#4	95-100								
#8	80-100								
#16	50-85								
#30	25-60								
#50	5-30								
#100	0-10								
Dry Unit WT (PCF)									
Absorption(%)									
FM									

Remarks:

Mix Design
Trial Batches Proportions
MDS

Material (Trial Batch Proportions Per Cubic Yard)			Trial Batch No. #1	#2	#3	#4
1. Cement						
Type:	Source:		LB:	LB:	LB:	LB:
2. Other Cementitious Material						
Type:	Source:		LB:	LB:	LB:	LB:
Grade/Class:						
3. Aggregate No. 1 (Fine) SSD						
Type:	Source:		LB:	LB:	LB:	LB:
Sp. Gr.:	FM:	Absorption (%):				
4. Aggregate No. 2 (Coarse) SSD						
Type:	Source:		LB:	LB:	LB:	LB:
Sp. Gr.:	Size:	Absorption (%):				
5. Aggregate No. 3 & 4 (Coarse) SSD						
Type:	Source:		LB:	LB:	LB:	LB:
Sp. Gr.:	Size:	Absorption (%):				
6. Aggregate No. 2 (Lightweight, Alternative)						
Type:	Source:		Oven Dry: LB:	LB:	LB:	LB:
Sp. Gr.:	Size:	Absorption (%):	Wet: LB:	LB:	LB:	LB:
7. Water (Total):			LB:	LB:	LB:	LB:
8. Water-Cementitious Ratio:						
9. Chemical Admixtures						
No. 1 Type:			WT (OZ):	WT (OZ):	WT (OZ):	WT (OZ):
No. 2 Type:			WT (OZ):	WT (OZ):	WT (OZ):	WT (OZ):
No. 3 Type:			WT (OZ):	WT (OZ):	WT (OZ):	WT (OZ):
10. Total Mass			LB:	LB:	LB:	LB:
11. Total Mass Per Cubic Foot (Theoretical Unit Weight)			PCF:	PCF:	PCF:	PCF:

Mix Design
Mixture Properties
MDS

Properties	ASTM	Target Per Specification	Trial Batch No. #1	#2	#3	#4
1. Fresh Concrete						
Temperature (F):	C1064					
Slump (IN):	C143					
Before Add						
End of Mixing						
15 (MIN)						
30 (MIN)						
45 (MIN)						
1 (HR)						
Unit WT (PCF):	C138					
Air Content (%):	C231/C17					
Mortar Content (%):						
Yield (CU FT/CU						
Water-Cementitious						
Time of Set (MIN):	C403					
Initial (MIN):						
Final (MIN):						
Difference (MIN):						
2. Hardened Concrete						
Cylinder No.			1 (A-	2 (A-	3 (A-	4 (A-
Compressive Strength	C39/C192					
3 Days						
Specimen 1						
Specimen 2						
Average						
7 Days						
Specimen 1						
Specimen 2						
Average						
28 Days						
Specimen 1						
Specimen 2						
Specimen 3						
Average						

Mix Design
Mixture Properties
MDS

Properties	ASTM	Target Per Specification	Trial Batch No.			
			#1	#2	#3	#4
56 Days (If Required by Contract Only)						
Specimen 1						
Specimen 2						
Average						
Shrinkage (%):	C157					
_____Days						
Specimen 1						
Specimen 2						
Average						
_____Days						
Specimen 1						
Specimen 2						
Average						
Observations						
Color						
Bleeding						
Heat Signature (If Specified in the Specification and for the Submitted Batch Only)						

Trial Batch No. (Submitted and Recommended for Approval):

Comments:

Laboratory Director (Print):	Company:	Signature & Seal:	Date:
CQAP WITNESS (Print):	Company:	Signature:	Date:

Contractor (Print):	Company:	Signature:	Date:
Designer Of Record (Print):	Company:	Signature:	Date:

Mix Design
Laboratory Trial Batch Mix Design Data
MDS

- TO BE COMPLETED BY CQAP -

Contract No.	Contract Name:	Basic Description of Specified Mix Design (Mix Design Common Name):	Trial Batch Date:
Batch Plant Name:	Design Trial Lab Name:	Class (Specified Strength): PSI + %	Weight Type: ☐ Normal ☐ Lightweight
			Concrete Type: ☐ Pump ☐ Conventional

Description				Weight Per Cubic Yard			
Mix Point No.:				1	2	3	4
Cement:			LB				
Cementitious:			LB				
Sand:			LB				
Stone:			LB				
Stone:			LB				
Water:			G				
Water:			LB				
Admixture:		Air	O				
Admixture:		HRWR/	O				
Unit Weight:			PC				

Description				Laboratory Trial Batch Weights			
Mix Point No.:				1	2	3	4
Cement:			LB				
Cementitious:							
Sand:			LB				
Stone:			LB				
Stone:			LB				
Water:			LB				
Admixture:		Air	M				
Admixture:		HRWR/	M				

Description			Trial Batch Results							
Mix Point No.:			1		2		3		4	
Time:			Initi	30	Initi	30	Initi	30	Initi	30
Slump:		IN								
Water Content:		LBS								
Water Used:		LBS								
Computed Mix		LBS								
Total Mix		LBS								
Unit Weight:		LBS								
		PCF								
Air:		%								
Temp:		DEG								
Actual W/C										

Comments			
CQAP WITNESS (Print):	Company:	Signature:	Date:

Mix Design
Trial Batch Strength Test Results Form
ASTM C39/ C192

- TO BE COMPLETED BY CQAP -

Contract No.	Contract Name:	Design Trial Lab Name:	Class (Specified Strength): PSI + %	Trial Batch Date:

Preliminary Strength Testing (See Page 1 for Preliminary Strength Age):

Age of Specimen:	Trial Batch #1 (Maximum Load / PSI)	Trial Batch #2 (Maximum Load / PSI)	Trial Batch #3 (Maximum Load / PSI)	Trial Batch #4 (Maximum Load / PSI)
Testing Date:	#1	#2	#3	#4
Specimen 1				
Specimen 2				
Specimen 3				
Average				

Comments:

CQAP WITNESS (Print): Company: Signature: Date:

Final Strength Testing (See Page 1 for Final Strength Age):

Age of Specimen:	Trial Batch #1	Trial Batch #2	Trial Batch #3	Trial Batch #4
Testing Date:	#1	#2	#3	#4
Specimen 1				
Specimen 2				
Specimen 3				
Average				

Comments:			
CQAP WITNESS (Print):	Company:	Signature:	Date:
CQAP CPM Comments (Preliminary & Final Age Testing):			
CQAP CPM (Print):	Company:	Signature:	Date:

Mix Design
Trial Batch Strength Test Results Form
ASTM C39/ C192

- TO BE COMPLETED BY CQAP -

Contract No.	Contract Name:	Design Trial Lab Name:	Class (Specified Strength): PSI + %	Trial Batch Date:

Additional Strength Testing:

Age of Specimen:	Trial Batch #1 (Maximum Load / PSI)	Trial Batch #2 (Maximum Load / PSI)	Trial Batch #3 (Maximum Load / PSI)	Trial Batch #4 (Maximum Load / PSI)
Testing Date:	#1	#2	#3	#4
Specimen 1				
Specimen 2				
Specimen 3				
Average				

Comments:

CQAP WITNESS (Print): Company: Signature: Date:

Additional Strength Testing:

Age of Specimen:	Trial Batch #1 (Maximum Load / PSI)	Trial Batch #2 (Maximum Load / PSI)	Trial Batch #3 (Maximum Load / PSI)	Trial Batch #4 (Maximum Load / PSI)
Testing Date:	#1	#2	#3	#4
Specimen 1				
Specimen 2				
Specimen 3				

Average				
Comments:				
CQAP WITNESS (Print):	Company:	Signature:		Date:
CQAP CPM Comments (Preliminary & Final Age Testing):				
CQAP CPM (Print):	Company:	Signature:		Date:

CONTRACT GI-CONS-7
SECTION 03 32 00
JOINTS IN CONCRETE

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 10 00 - Concrete Forming and Accessories

B. Section 03 30 00 - Cast-in-Place Concrete

1.3 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ACI 224.3 - Joints in Concrete Construction.

B. ASTM C 990 - Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

C. ASTM C 1016 - Test Method for Determination of Water Absorption of Sealant Backing (Joint Filler) Material.

D. ASTM D 545 - Test Methods for Preformed Expansion Joint Fillers for Concrete Construction (Nonextruding and Resilient Types).

E. ASTM D 994 - Preformed Expansion Joint Fillers for Concrete (Bituminous Type).

F. ASTM D 1190 - Concrete Joint Sealer, Hot-Applied Elastic Type.

G. ASTM D 1191 - Test Methods for Concrete Joint Sealers.

H. ASTM D 1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

I. ASTM D 1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

J. ASTM D 2835 - Lubricant for Installation of Preformed Compression Seals in Concrete Pavements.

K. ASTM D 5329 - Test Methods for Sealants and Fillers, Hot-Applied, For Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements.

L. ASTM D 5973 - Elastomeric Strip Seals with Steel Locking Edge Rails Used in Expansion Joint Sealing.

M. ASTM D 5898 - Guide for Standard Details for Adhered Sheet Waterproofing.

N. ASTM E 1612 - Preformed Architectural Compression Seals for Buildings and Parking Structures.

O. ASTM E 1783 - Preformed Architectural Strip Seals for Buildings and Parking Structures.

P. ASTM F 1123 - Non-Metallic Expansion Joints.

Q. ACI 318 - Building Code Requirements for Structural Concrete.

R. New York City Building Code.

S. NYC Department of Transportation, Standard Highway Specifications.

T. U.S. Army Corps of Engineers Specifications for Polyvinyl Chloride Waterstops, CRD-C572.

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. Contractor shall submit Shop drawings and material specifications for the approval of the Engineer. Submittals shall include, but not be limited to:

1. Information as shown on the Contract Drawings and at the Site, where necessary.

2. Sizes, sections, reinforcement and dimension of units, the jointing, dowels, anchors, etc., and all other necessary details.

3. Installation of joints, including various connections, anchorage details, special jointing, the Contractor's proposed construction and control joints, and other accessories as required to complete the Work.

4. Prior to installation, the Contractor shall submit layout drawings for approval, showing the location and type of all joints proposed in each structure. The layout drawings shall clearly indicate the extent of the waterstop installations that are proposed to ensure that all construction and expansion joints, in water-containing structures, will be watertight. The drawings shall include elevations, sections, etc., and all details to show that a continuous watertight installation is provided.

5. Equipment pad layout drawings.

B. Manufacturer's specifications and installation instructions for each type of required joint and accessory shall be submitted. These include expansion joint fillers, expansion joint sealers, waterstops, shapes of waterstops, chemical retarders, adhesives, sleeves, inserts, anchors, embedded items, and similar items.

C. The Contractor shall submit to the Engineer one sample of each type of waterstop. Each

sample shall include a splice.

D. Method to be used to roughen construction joints and achieve bond including product identification as applicable.

E. Applicator's Qualifications.

F. Proof of satisfactory field service of sealants.

G. Identify the percentage of recycled material used within joint materials. Twenty percent (20%) of joint material shall be of recycled content.

H. Identify the percentage of joint material in accordance with the regional content requirements. Ninety percent (90%) of joint material shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

Material	**Distance from the Site Requirement**
Joint Material	500 miles

1.7 QUALITY CONTROL

A. Reviews of Shop Drawings shall be obtained before custom fabrication is started and before delivery of materials to the Project Site.

B. Work of this Section shall be coordinated with the Work of other trades so that construction is not delayed.

C. Contractor is responsible for joint installation procedures and health and safety of the Work force and compliance with requirements of authorities having jurisdiction.

D. Contractor shall construct a watertight condition at expansion joints and construction joints and is responsible for any errors of detailing and fabrication .

E. Defective Work, as determined by the Engineer, shall be remedied by cutting and rebuilding the concrete walls and slabs, replacing the waterstop assemblies or other methods as approved by the Engineer.

1.8 DESCRIPTION

a. The Contractor shall install joint material per the construction schedule submitted to and approved by the Engineer in a sequence and manner that will not damage the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered to the Site in an undamaged condition and at such intervals as will avoid delay in the Work.

B. Materials shall be stored and protected in a clean, properly drained location and shall be kept off the ground under a weather-tight covering permitting good air circulation. Materials shall be stored on dry wood sleepers, pallets, platforms or other appropriate supports which have slope for positive drainage. Materials shall be protected from distortion, excessive stresses, corrosion and other damage. Materials shall not be stored on the structure in a manner that might cause distortion or damage to the supporting structure. The maximum uniform distributed storage load shall not exceed twenty (20) pounds per square foot.

C. Materials shall be protected before, during and after installation to ensure acceptable finished Work. In-place materials and other Work in connection with the joint installations shall be protected.

D. Material shall be handled safely in a manner that will prevent distortion or other damage. Care shall be exercised at all times to avoid damage through careless handling during unloading, storing and installing.

E. In the event of damage to the Work, necessary repairs or replacements shall be performed until satisfactory Work is met at no expense to the DEP.

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Concrete Bonding Agent

1. The concrete bonding agent shall be:

a. Corr-Bond, as manufactured by Euclid Chemical, East Brunswick, NJ.

b. Armatec 110, as manufactured by Sika Chemical Company, Lyndhurst, NJ

c. Or approved equal

B. Expansion joint fillers (Type I) shall be:

1. Type FF-7 cross-linked, closed cell polyethylene, as manufactured by Progress Unlimited Inc., Lynbrook, NY.

2. Type W, cross-linked, closed cell polyethylene, as manufactured by Hydrozo/Jeene, Inc, Lincoln, NE.

3. Or approved equal.

C. Joint Sealants:

1. Type A shall be

   a. Sikaflex-2C NS/SL as manufactured by Sika Corporation, Lyndhurst, NJ.

   b. Sonolastic SL-1, as manufactured by Sonneborn/Master Business Solution, Parsippany, NJ.,

   c. Permapol RC-270 Reservoir Sealant, as manufactured by Products Research and Chemical Company, (now is Courtaulds, PLC,) London W1A2BB, England.

   d. Or approved equal.

2. Type B shall be

   a. Magnum NS-100, as manufactured by Tamms Industries, Kirkland, IL.

   b. Sikaflex 1A, Sika Corporation, Lyndhurst, NJ.

   c. Or approved equal.

3. Type C shall be

   a. Sonolastic Two-part, as manufactured by Sonneborn/Master Business Solution, Parsippany, NJ.

   b. Hornflex-L, as manufactured by Tamms Industries, Kirkland, IL.

   c. Cormax PSC, as manufactured by DuPont, (Multiple locations in USA).

   d. Or approved equal.

D. PVC waterstops shall be:

1. Model 679 for construction joints, Model 738 for one (1) inch expansion joints, and Model 700 for 2-inch expansion joints, as manufactured by Greenstreak/Sika Corp USA, Lyndhurst, NJ.

2. Or approved equal.

E. Retrofit Waterstops shall be:

1. Model 609 for construction joint retrofit waterstop and Model 667 for expansion joint retrofit waterstop, as manufactured by Greenstreak/Sika Corp, Lyndhurst, NJ.

2. RF-638 for construction joint retrofit waterstop and RF-912 for expansion joint retrofit waterstop, as manufactured by BoMetals, Inc, Carrollton, GA.

3. Type 18 kit for construction joint retrofit waterstop and Type 18-9 kit for expansion joint retrofit waterstop, as manufactured by DuraJoint Concrete Accessories, Garrettsville, OH.

4. Or approved equal.

F. Hydrophilic Rubber Waterstops shall be:

1. Adeka Ultraseal MC-2010M (for concrete thickness greater than 9 inches), Adeka Ultraseal KBA-1510FF (for concrete thickness less than 9 inches), or Adeka UltrasealMC-2005T (for sealing around H-piles) as manufactured by Asahi Denka Kogyo KK, Japan

2. Hydrotite CJ-1020-2K, as manufactured by Greenstreak/Sika Corp, Lyndhurst, NJ.

3. Or approved equal.

G. Hydrophilic Sealant shall be:

1. Adeka Ultraseal P-201, by Asahi Denka Kogyo K.K, Japan.

2. Leakmaster LV-1, by Greenstreak/Sika Corporation, Lyndhurst, NJ.

3. Or approved equal.

H. Hydrophilic Injection Resin shall be:

1. Duroseal Inject 1K/2K, by BBZ, USA, Inc., St. Louis, MO.

2. Sika Injection 29 by Sika Corporation, Lyndhurst, NJ.

3. Or approved equal.

I. Injection Hose Waterstops shall be:

1. Fuko Injection System, as manufactured by BBZ USA Inc., St. Louis, MO.

2. Sika Swell Hose as manufactured by Sika Corporation, Lyndhurst, NJ.

3. Or approved equal.

2.2 MATERIALS / EQUIPMENT

1. Concrete Bonding Agent

a. The concrete bonding agent product and manufacturer shall be as specified in this Section.

b. Surface preparation, application and curing shall be performed in strict accordance with the manufacturer's directions.

B. Preformed Expansion Joint Filler

1. Preformed expansion joint filler shall be nonextruding, and shall be of the following types:

   a. Type I Sponge Rubber, conforming to ASTM D 1752, Type I.

   b. Type II Cork, Conforming to ASTM Designation D 1752, Type II.

   c. Type III Self-expanding cork, conforming to ASTM Designation D 1752, Type III.

   d. Type IV Bituminous Fiber, conforming to ASTM Designation D 1751.

2. Expansion joint fillers (Type I) product and manufacturer shall be as specified in this Section.

3. Unless otherwise specified, Type II and Type III shall conform to the requirements of the Standard Highway Specifications of the NYC Department of Transportation.

4. Asphaltic blown joint filler for sealing joints over Type IV preformed joint filler shall comply with the requirements of Section 2.16 of the Standard Highway Specifications of the NYC Department of Transportation.

C. Joint Sealants

1. Type A: Multi-component, non-sag, low-modulus polyurethane rubber sealant meeting ASTM C 920, Type M, Grade NS, Class 25, use NT, M, A, and O Capable of withstanding fifty percent (50%) in extension or compression shall be as specified in this Section

2. Type B: Single component polyurethane sealant meeting ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, A, and O, capable of withstanding twenty-five percent (25%) in extension or compression shall be as specified in this Section.

3. Type C: Multi-component chemical resistant polysulfide sealant conforming to ASTM C 920, Type M, Grade NS, Class 25 shall be as specified in this Section

D. Backer Rod

1. Backer rod shall be an extruded closed-cell polyethylene foam rod. The material shall be compatible with the sealant material used and shall have a tensile strength of not less than forty (40) psi and a compression deflection of approximately twenty-five percent (25%) at eight (8) psi. The rod shall be one-eighth (1/8) inch larger in diameter than the joint width at joints less than three-quarter (3/4) inch wide and one-quarter (1/4) inch larger in diameter at joints three-quarter (3/4) inch end wider.

E. PVC Waterstops

1. PVC waterstops shall be manufactured from virgin polyvinylchloride and shall meet or exceed all requirements set forth in the U.S. Army Corps of Engineers

Specification CRD C 572.

2. All PVC waterstops shall be of polyvinylchloride extruded from an elastomeric plastic compound of which the basis resin shall be polyvinylchloride. The compound shall contain any additional resins, plasticizers, stabilizers or other materials needed to ensure qualities which will meet the requirements herein specified.

3. The required minimum physical characteristics for this material are:

   a. Tensile strength 1,750 psi

   b. Ultimate elongation not less than 280%.

4. No reclaimed PVC materials shall be used for manufacture of the waterstops. The Contractor shall furnish certification that the proposed waterstops meet the above requirements.

5. PVC waterstops for construction joints shall be flat ribbed type, six (6) inches wide unless otherwise shown on the Contract Drawings, with a minimum thickness at any point of three-eights (3/8) inches.

6. PVC waterstops for expansion joints shall be ribbed with a center bulb. PVC waterstops for one (1) inch expansion joints shall be nine (9) inches wide with a minimum thickness at any point of three-eights (3/8) inches. The center bulb shall have an O.D. not less than one (1) inch. PVC waterstops for two (2) inch expansion joints shall be nine (9) inches wide with a minimum thickness at any point of three-eights (3/8) inches. The center bulb shall have an O.D. not less than one and three-eights (1-3/8) inches.

7. All PVC waterstops shall have an integral fastening system consisting of hog rings and grommets

8. All waterstop intersections, both vertical and horizontal, shall be made from factory fabricated corners and transitions. Only straight butt joint splices shall be made in the field.

9. PVC waterstops product and manufacturer shall be as specified in this Section.

F. Retrofit Waterstops

1. Retrofit waterstops shall be used where specifically indicated on Contract Drawings for sealing joints between existing concrete construction and new construction.

2. Retrofit waterstops shall be PVC waterstops fabricated from material as described in this Section.

3. Retrofit waterstop manufacturer shall provide a complete system, including waterstop, all stainless steel anchoring hardware, and epoxy for installation

4. All waterstop intersections, both vertical and horizontal, shall be made from

factory fabricated corners and transitions. Only straight butt joint splices shall be made in the field.

5. Retrofit waterstop product and manufacturer shall be as specified in this Section.

G. Hydrophilic Rubber Waterstop

1. Hydrophilic rubber waterstop materials shall be bentonite-free and shall expand by a minimum of eighty percent (80%) of dry volume in the presence of water to form a watertight joint seal without damaging the concrete in which it is cast. For location, see the Contract Drawings.

2. The material shall be composed of resins and polymers which absorb water and cause an increase in volume in a completely reversible and repeatable process. The waterstop material shall be dimensionally stable after repeated wet-dry cycles with no deterioration of swelling potential.

3. Hydrophilic rubber waterstop shall be solid rectangular shape with minimum cross sectional dimensions of three-eighth (3/8) inch by three-quarter (3/4) inch.

4. Hydrophilic Rubber Waterstops product and manufacturer shall be as specified in this Section.

H. Hydrophilic Sealant

1. The Hydrophilic Sealants shall adhere firmly to concrete, metal and PVC in dry or damp conditions. When cured, it shall be elastic indefinitely.

2. Hydrophilic Sealants product and manufacturer shall be as specified in this Section.

I. Hydrophilic Injection Resin

1. Hydrophilic injection resin shall be acrylate-ester based. Its viscosity shall be less than fifty (50) cps. It shall be water soluble in its uncured state, solvent free, and non-water reactive. In the cured state, it shall form a solid hydrophilic flexible material which is resistant to permanent water pressure and shall not attack bitumen, joint sealants or concrete.

2. Hydrophilic Injection Resin product and manufacturer shall be as specified in this Section.

J. Injection Hose Water Stop

1. Injection hose shall consist of a PVC or neoprene central core of sufficient strength to resist the weight of a minimum of twenty-five (25) feet of fresh concrete placed upon it. Injection openings shall be provided closely spaced along the length of the hose and in a minimum of three (3) locations equally spaced around the perimeter of the hose. The openings shall be sealed by strips of closed cell foam of a consistency to act as one-way valves preventing entrance of cement paste while allowing free flow of injection material, pumped through the hose, into the concrete joint surface.

2. Injection hose system shall be appropriate for the injection of hydrophilic injection resin. The hose shall allow for vacuuming operations and repeated use. The construction of the hose shall permit free discharge of the specified injected grout into the concrete without backwash, for the entire length of the hose.

3. Injection hose system shall be complete with hold-down clips, connection tubes, fittings and injection connections designed to be mounted flush with the concrete surface and sealed to allow for future injections. All components of the system shall be provided by the same manufacturer.

4. Injection Hose Waterstops product and manufacturer shall be as specified in this Section.

2.3 FABRICATION / ASSEMBLING / FINISHES (NOT USED)

2.4 SOURCE QUALITY CONTROL / SHOP TESTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION

A. Field Measurements

1. Prior to commencement of the Work, existing dimensions, elevations, locations and conditions applicable to the Work shall be field verified. Variances and discrepancies from the Contract Drawings and potential interferences shall be reported promptly to the Engineer.

2. Sufficient field measurements shall be taken prior to preparation of Shop Drawings and fabrication of construction materials, where possible, to ensure proper fitting of the Work. However, job progress shall not be delayed. Allow for adjustments and fittings wherever the taking of field measurements before fabrication may not be possible or might delay the Work.

3. Actual field-verified conditions may require modifications to the fabrication and/or erection details indicated on the Contract Drawings. The Work shall be performed to meet actual field conditions encountered.

B. Preparation

1. The Contractor shall examine the areas and conditions under which the Work of this Section is to be performed. Conditions detrimental to the proper and timely completion of the Work shall be corrected. Work shall not be proceeded until unsatisfactory conditions have been corrected.

2. All new placement of concrete shall be in accordance with DEP Standard Specifications for On-Site Green Infrastructure Section 03 30 00 – Cast-In-Place Concrete.

3. Concrete shall not be allowed to enter the joint or the space for the sealant and

destroy the proper functions of the joint.

4. The surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed by wire brushing, air or light sand blasting.

5. The joint shall be thoroughly clean and free from dirt and debris before the primer and the sealant are applied. Where the finished joint will be visible, masking of the adjoining surfaces shall be carried out to avoid their discoloration. The sealant shall be neatly tooled into place and its finished surface shall present a clean and even appearance.

6. All joints shall be sealed as shown on the Contract Drawings.

3.2 IMPLEMENTATION

A. General:

1. Materials shall be protected before, during and after installation to ensure acceptable finished Work. In-place materials and other operations of Work in connection with the joint installations shall be protected.

2. The Contractor shall install joint material per the construction schedule submitted to and approved by the Engineer in a sequence and manner that will not damage the Work.

3. In the event of damage to the Work, necessary repairs or replacements shall be performed until satisfactory Work is met at no expense to DEP.

B. Construction Joints

1. Contractor shall submit description of all joints and their locations to the Engineer for approval, in accordance with this Section. Construction joints shall be as shown on the Contract Drawings where joints are indicated.

2. Unless noted otherwise on the Contract Drawings, construction joints shall be located near the middle of the spans of slabs, beams, and girders unless a beam intersects a girder at this point. In this case, the joints in the girders shall be offset a distance equal to twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and the top of footings or floor slabs unless noted otherwise on the Contract Drawings. Beams, girders, brackets, column capitals, haunches, and drop panels shall be placed at the same time as slabs. Joints shall be perpendicular to the main reinforcement.

3. Maximum distance between horizontal joints in slabs and vertical joints in walls shall be 45'-0" unless otherwise indicated on the Contract Drawings.

4. All corners shall be part of a continuous placement, and should a construction joint be required, the joint shall not be located closer than five (5) feet from a corner.

5. Waterstop shall be provided at all joints in water retaining structures. Waterstop shall be provided at all joints below grade in walls or slabs which enclose an

accessible area.

6. All reinforcing steel and welded wire fabric shall be continued across joints. Inclined dowels shall be provided as detailed or directed by the Engineer.

7. The surface of the concrete at all joints shall be thoroughly cleaned and all laitance removed. Following methods are acceptable:

   a. The use of an approved chemical retarder applied in accordance with the manufacturer's recommendations which delays but does not prevent the setting of the surface mortar. Retarded mortar shall be removed within twenty-four (24) hours after placing to produce a clean exposed aggregate bonding surface.

   b. By roughening the surface of the concrete in an approved manner which will expose the aggregate uniformly and will not leave laitance, loosened particles of aggregate or damaged concrete at the surface.

8. All construction joints shall be bonded by one of the following methods:

   a. The use of an approved adhesive applied in accordance with the manufacturer's recommendations.

   b. Use of Portland cement grout of similar proportions to the mortar in the concrete in an acceptable manner.

C. Control Joints

1. Location of control joints shall be as shown on the Contract Drawings or as allowed by the approved joint location submittals.

2. Control joints shall be formed with control joint inserts.

3. Sawcutting of control joints in lieu of forming shall not be allowed unless otherwise noted on the Contract Drawings. Where sawcutting is allowed, joints shall be sawed as soon as the concrete can support foot traffic without leaving any impression, normally the same day as concrete is placed and in no case longer than twenty-four (24) hours after concrete is placed.

4. Unless noted otherwise on the Contract Drawings, depth of control joints shall be one and one-half (1-1/2) inches in reinforced concrete and one-third (1/3) of concrete thickness in unreinforced concrete.

D. Expansion Joints

1. Size and location of expansion joints shall be as shown on the Contract Drawings.

2. A center-bulb type waterstop shall be provided at all expansion joints in water-retaining structures. A center-bulb type waterstop shall be provided at all expansion joints below grade in walls or slabs which enclose an accessible area. Waterstop shall be as shown on the Contract Drawings and specified herein.

3. Expansion joint filler for use in concrete pavements and structures shall be Types I, II, or III. Expansion joint filler-for use in sidewalk and curbing shall be Type IV.

4. Reinforcement or other embedded items bonded to the concrete (except dowels in floors bonded on only one side of joint) shall not be permitted to extend continuously through any expansion joint.

E. Installation of Joints and Joint Filler

1. Type B joint sealant shall be used in all expansion and control joints in concrete except Type A joint sealant shall be used in all concrete pavements and floors subject to heavy traffic and Type C joint sealant shall be used in high corrosive areas unless otherwise specified or shown on the Contract Drawings.

2. Joint fillers and sealants shall be installed in accordance with manufacturer's recommended procedures and as shown on the Contract Drawings. Prior to sealant installation, the Contractor shall arrange to have a representative of the sealant manufacturer instruct the crew doing the Work as to the proper methods of surface preparation, mixing and application of the sealant. The joint filler shall be furnished with a pressure sensitive adhesive or a separate adhesive as recommended by the manufacturer.

3. Joint filler that will be exposed after removal of forms shall be cut and trimmed to ensure a neat appearance and shall completely fill the joint except for the space required for the sealant. The filler shall be held securely in place and no concrete shall be allowed to enter the joint or the space for the sealant and destroy the proper functions of the joint.

4. A bond breaker of polyethylene film shall be used between filler and sealant. The joint shall be thoroughly clean and free from dirt and debris and shall receive a light sand blasting before the primer and the sealant are applied. Where the finished joint will be visible, masking of the adjoining surfaces shall be carried out to avoid their discoloration.

5. The primer and sealant used shall be supplied by the same manufacturer. Sealant shall not be placed without the use of a primer.

6. The sealant shall be neatly tooled into place and its finished surface shall present a clean and even appearance.

7. The depth of the sealant shall not exceed the width of the joint.

8. All sealants used in water retaining structures shall achieve final cure at least seven (7) days before the structure is filled with water.

F. PVC Waterstops and Retrofit Waterstops

1. The design and location of PVC and retrofit waterstops in construction joints and expansion joints shall be as specified herein and shown on the Contract Drawings. Splices in waterstops shall be made, as recommended by the manufacturer.

2. Each piece of premolded PVC and retrofit waterstop shall be of maximum practicable length in order that the number of end joints will be held to a minimum.

3. Joints shall develop effective watertightness fully equal to that of the continuous PVC and retrofit waterstop material and shall permanently develop not less than eighty percent (80%) of the mechanical strength of the parent section and shall permanently retain its flexibility.

4. PVC waterstops shall be installed in the Work so that they are embedded to an equal depth in concrete on both sides of the joint in keyways as shown on the Contract Drawings and shall be kept free from oil, grease, mortar or other foreign matter. Retrofit waterstops shall be installed as shown on the Contract Drawings using approved waterstop adhesive and Type 316 stainless steel batten bars and expansion anchors. PVC and retrofit waterstops shall be adequately secured against movement during the pouring of concrete. Contractor shall submit methods of waterstop installation to the Engineer for approval prior to placing the concrete. Concrete adjacent to waterstops shall be placed in twelve (12) inch lifts and power vibrated to prevent honeycombing, voids and separation of aggregates at the surfaces of concrete separation joints.

   a. PVC and retrofit waterstop fabrications for all changes of direction, intersections and transitions shall be made in the shop, leaving only straight butt joint splices for the field.

G. Butt joint splices of PVC waterstop runs shall be made by heat sealing the adjacent surfaces in accordance with the manufacturer's recommendations using a thermostatically controlled electric source of heat. At least three satisfactory field splices shall be made as samples on-site. The Engineer may require tests on these splices by an approved laboratory, at the Contractor's expense, to certify the tensile strength of the joint. The strength attained shall be at least eighty percent (80%) of the unspliced material before any is used in the Work.

H. Hydrophilic Waterstop

1. Hydrophilic rubber waterstop or sealant shall be installed in accordance with the manufacturer's instructions and recommendations, except as modified herein.

2. The manufacturer shall provide technical assistance in the field.

3. The waterstop or sealant shall be located as near as possible to the center of the joint and shall be continuous around the entire joint. The minimum distance from the edge of the waterstop to the face of the member shall be three (3) inches.

4. Where a hydrophilic rubber waterstop is used in combination with PVC waterstop, the hydrophilic rubber waterstop shall overlap the PVC waterstop for a minimum of six (6) inches. The contact surface between the hydrophilic rubber waterstop, and the PVC waterstop shall be filled with hydrophilic sealant.

5. The hydrophilic rubber waterstop shall be installed in a bed of hydrophilic sealant, before skinning and curing begins, so that any irregularities in the concrete surface

are completely filled and the waterstop is bonded to the sealant. After the sealant has cured, concrete nails, with washers of a diameter equal to the waterstop width shall be placed to secure the waterstop to the concrete at a maximum spacing of eighteen (18) inches.

6. Prior to installation of hydrophilic sealant, the concrete surface shall be wire brushed or sand blasted to remove any laitance or other materials that may interfere with the bonding. Surfaces of metal or PVC to receive sealant shall be cleaned of paint and any material that may interfere with bond. When sealant alone is shown on the Contract Documents, it shall be placed in a built-up bead which has a triangle cross section with each side of the triangle at least three-fourth (3/4) inch in length, unless indicated otherwise. Concrete shall not be placed until the sealant has cured in accordance with the manufacturer's recommendations.

I. Injection Hose Waterstop

1. The injection hose shall be installed in maximum lengths of forty (40) feet and shall be located as shown on the Contract Drawings. The hose shall be clamped into position with anchor clips spaced approximately six (6) to ten (10) inches apart.

2. The concrete surface shall be cleaned of stones and debris prior to installation of injection hose. The injection hose shall be installed in direct contact with the face of concrete at the construction joint to prevent floating of the hose in the freshly placed concrete.

3. Where injection hose is used in combination with PVC waterstop, the hose shall overlap the PVC waterstop for a minimum of six (6) inches and shall be less than two (2) inches away from the PVC.

4. The injection procedure shall be performed in strict conformance with the manufacturer's recommendations. The injection shall be made by an authorized applicator as recommended by the injection system supplier.

5. The injection system supplier or his approved representative shall provide the necessary supervision to satisfy the Engineer that the application conforms strictly to the manufacturer's recommendations.

6. The injector hose and opposite hose vent for each hose length shall be terminated in the injection boxes mounted on the dry side of the wall. At the end of the injection operation, the hose shall be cleaned in accordance with the procedure recommended by the manufacturer. The injection ends and the vents shall be plugged and the box covered leaving the system ready for reinjection in the event that the joint is leaking.

3.3 FIELD TESTING / QUALITY CONTROL (NOT USED)

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP

CONTRACT GI-CONS-7
SECTION 03 32 00
JOINTS IN CONCRETE

A. PROTECTION

1. Joints and accessories shall be protected from damaging from traffic during the entire construction period. Waterstops provided for adjoining future structures shall be protected from corrosion as shown on the Contract Drawings.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 35 00
CONCRETE FINISHING

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.3 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various contract items.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Reference Standards:

1. New York City Building Code.

2. ACI 301 - Specifications for Structural Concrete for Buildings

3. ACI 318 - Building Code Requirements for Structural Concrete

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. The Contractor shall submit Shop Drawings and material specifications for the approval of the Engineer. Submittals shall include, but not be limited to:

1. Material certifications and technical data sheets.

2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement, and appropriate uses for each type of material used in the Work.

B. Identify the percentage of recycled material used within concrete finishing materials. Twenty percent (20%) of concrete finishing materials shall be of recycled content.

C. Identify the percentage of concrete finishing materials in accordance with the regional content requirements. Ninety percent (90%) of concrete finishing materials shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii as the crow flies from the Project Site, as listed in Table A.

CONTRACT GI-CONS-7
SECTION 03 35 00
CONCRETE FINISHING

Table A: Regional Content Requirements

Material	**Distance from the Site Requirement**
Concrete Finishing Materials	500 miles

1.7 QUALITY CONTROL

A. Erect, on the Site where directed, a full size mock-up of a cast-in-place wall or panel a minimum of four (4) feet high, four (4) feet from the corner on two (2) sides, twelve (12) inches thick or as shown in the Contract Drawings conforming to ACI 303R.

1. Reinforce the panel as shown in the Contract Drawings. Use form ties the same as those approved and with the form tie pattern similar to that approved. Use one face for the panel for smooth architectural concrete including "reveal" rustication with form joints, and the opposite face for form liner concrete.

2. Plug the tie holes as specified to determine the correct mortar mixture to match the panel color. If required, remove and replace tie hole plugging mortar until an acceptable color match is obtained. After the sample panels have been approved, intentionally damage and patch portions of the finish surface of the panels for the purpose of determining the correct mixture for patching mortar and patching technique to match the original panel color and surface.

3. Leave the approved mock-up on the job during construction as the standard of workmanship for the Project. Remove mock-up form the premises after completion of the Work.

1.8 DESCRIPTION (NOT USED)

1.9 DELIVERY, STORAGE, AND HANDLING

A. General: Failure to comply with the following shall be sufficient cause for rejection of materials by Engineer and his requiring its removal from the Site. Supply new material at no additional expense to the DEP.

B. Delivery of Materials:

1. Deliver materials in manufacturer's original unopened and undamaged containers, with information accurately representing container contents as approved by the Engineer at time of Working Drawing submission.

2. Include the following information on the label:

a. Name of material and supplier.

b. Installation, handling and protection requirements.

3. Deliver materials in sufficient quantities to allow uninterrupted continuity of the Work.

C. Storage of Materials:

1. Store only approved materials on Project Site.

2. Store materials in original, undamaged containers with manufacturer's labels and seals intact.

3. Store all materials in a dry, enclosed area, off the ground and away from all possible contact with water and in a location where temperature can be constantly maintained between sixty (60)ºF and seventy-five (75)ºF and out of direct sunlight.

4. Prevent damage to materials during storage primarily by minimizing the amount of time they are stored at the job-site before being incorporated into construction systems.

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Concrete Floor Sealer

1. Floor sealer shall be:

a. Sonoglaze HS as manufactured by Sonneborn, Parsippany, NJ.

b. Masterseal 330 as manufactured by Master Builders Solutions, Shakopee, MN.

c. Eucothane as manufactured by Euclid Chemical, East Brunswick, NJ.

d. Or approved equal.

B. Concrete Floor Hardener

1. Liquid Floor hardener shall be:

a. Lapidolith as manufactured by Sonneborn, Parsippany, NJ.

b. Pena-Lith as manufactured by W.R. Meadows, Hampshire, IL.

c. Hornolith as manufactured by Tamms Industries, Cleveland, OH.

d. Surfhard as manufactured by Euclid Chemical Company, East Brunswick, NJ.

e. Or approved equal.

2. Aggregate floor hardener shall be:

a. Harcol, as manufactured by Sonneborn, Parsippany, NJ.

b. Maximent as manufactured by Master Builders Solutions, Shakopee, MN.

c. Surflex as manufactured by Euclid Chemical, East Brunswick, NJ.

d. Or approved equal.

C. Non-Slip Shake-On Aggregate

1. Non-Slip Shake-on aggregate shall be:

a. Frictex NS as manufactured by Sonneborn, Parsippany, NJ.

b. A-H Alox as manufactured by Anti-Hydro, Flemington, NJ.

c. Non-Slip as manufactured by Euclid Chemical East Brunswick NJ.

d. Or approved equal.

2.2 MATERIALS / EQUIPMENT

A. Concrete Floor Sealer product and manufacturer shall be as specified in this Section.

B. Concrete Floor Hardener

1. Liquid Floor hardener product and manufacturer shall be as specified in this Section.

2. Aggregate floor hardener product and manufacturer shall be non-metallic and shall be as specified in this Section.

C. Non-Slip Shake-On Aggregate

1. Shake-on aggregate product and manufacturer for non-slip floors shall be non-metallic and shall be as specified in this Section.

2.3 FABRICATION / ASSEMBLING / FINISHES (NOT USED)

2.4 SOURCE QUALITY CONTROL / SHOP TESTS (NOT USED)

CONTRACT GI-CONS-7
SECTION 03 35 00
CONCRETE FINISHING

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION (NOT USED)

3.2 IMPLEMENTATION

A. Finishes on Formed Concrete Surfaces

1. After removal of forms, the finishes described below shall be applied in accordance with – "Concrete Finish Schedule" included in this Section. Unless specified in the Contract, all surfaces shall receive at least a Type I finish. The Engineer shall be the sole judge of acceptability of all concrete finish work.

a. Type I - Rough or Board Form Finish: All fins, burrs and other projections left by the forms shall be removed. All holes left by removal of ties, and all other holes, depressions, or voids shall be filled solid with cement grout after first being thoroughly wetted. Honeycombs shall be chipped back to solid concrete as directed, prior to patching with cement grout. Holes shall be filled with a small tool that will permit packing the hole solidly with cement grout. Cement grout shall consist of one (1) part cement to three (3) parts sand, and the amount of mixing water shall be as little as consistent with the requirements of handling and placing. Color of cement grout shall match the adjacent wall surface. The surface shall be thoroughly cleaned of all stains or discolorations that will interfere with the final finish.

b. Type II - Smooth Form Finish: Concrete shall be cast against forms constructed of plywood not less than five-eighth (5/8) inch thick, or of boards lined with tempered hardboard not less than three-sixteenth (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. Form material shall utilize sheets as large as practicable in an orderly and symmetric configuration. Other aspects of the finish shall conform to the requirements of the rough form finish.

c. Type III - Grout Cleaned: Where this finish is required, it shall be applied after completion of Type II finish. After the concrete has been predampened, a slurry consisting of one (1) part cement (including an appropriate quantity of white cement in order to produce a color matching the surrounding concrete) and one and one-half (1-1/2) parts sand passing the No. 30 sieve, by damp loose volume, shall be spread over the surface with clean burlap pads or sponge rubber floats and scrubbed into the surface using a rotary motion. Any surplus material shall be removed by scraping and then rubbing with clean burlap. The finish shall be kept damp for at least thirty-six (36) hours after application.

d. Type IV - Smooth Rubbed: Where this finish is required, it shall be applied after the completion of the Type II finish no later than one (1) day following form removal. Nor rubbing shall be done before the concrete is thoroughly hardened and the mortar used for patching is firmly set. A smooth, uniform surface shall be

obtained by wetting the surface and rubbing it with a carborundum stone to eliminate irregularities. Unless the nature of the irregularities requires it, the general surface of the concrete shall not be cut into. Corners and edges shall be slightly rounded by the use of the carborundum stone. Brush finishing or painting with grout or neat cement will not be permitted.

e. Type V - Textured: Use textured forms or textured form liners of plastic, wood, or sheet metal. Secure liner panels in forms by cementing or stapling, not by methods which will permit impressions of nail heads, screw heads, washers, or the like to be imparted to the surface of the concrete. Seal edges of textured panels to each other or to divider strips to prevent bleeding of cement paste. Use a sealant that will not stain the concrete surface.

f. Type VI - Aggregate transfer: Produce aggregate transfer and other special finished that duplicate mock-ups or sample panels prepared in advance and accepted.

g. Type VII - Exposed Aggregate: Expose aggregate using one (1) of the following methods. Provide a concrete surface that will duplicate a mock-up or a sample panel prepared in advance and accepted.

1) For a scrubbed finish, cast concrete against form faces which have been coated with a chemical retarder used in accordance with the manufacturer's recommendations. Wet the partially hardened concrete surface thoroughly and scrub with fiber or wire brushes, using water freely until the surface mortar is removed and the aggregate is uniformly exposed. Then rinse the surface with clear water. If portions of the surface have become too hard to permit uniform aggregate exposure, use dilute hydrochloric acid (one [1] part commercial muriatic acid diluted with four [4] to ten [10] parts water) to remove the excess surface mortar after the concrete is at least two (2) weeks old. Remove the acid from the finished surface with clean water within fifteen (15) minutes after application.

2) For a blast finish, sandblast or waterblast the concrete surface to a degree sufficient to expose fine aggregates with occasional exposure of coarse aggregate, and to produce a uniform color with a maximum reveal of 1/16 inch unless specified otherwise in the Contract Documents. All surfaces with the same specified blast finish shall be done at approximately the same time after placing co concrete. Use stainless steel or plastic reinforcement supports and spacers near concrete surfaces to be blasted. Protect adjacent materials and inserts during blasting operations.

3) For a tooled finish, dress the thoroughly cured concrete surface with electric, air, or hand tools to a uniform texture removing surface mortar as specified in the Contract Documents. Then provide the

surface with a hand tooled, rough or fine pointed, crandalled, or bush-hammered surface texture, as specified by Contract Documents.

h. Type VIII - Applied: When finishes of stucco, cementitious coatings, or similar troweled materials are required or permitted, prepare the surface of the concrete to ensure permanent adhesion of the finish. If the concrete is less than twenty-four (24) hours old, roughen it with a heavy wire brush or scoring tool. If the concrete is older, roughen the surface mechanically or by acid etching. After roughening, wash the surface free of all dust, acid, chemical retarder, and other foreign material before any final finish is applied.

B. Slab and Floor Finishes

1. The finishes described below shall be applied to floors, slabs, flow channels and top of walls in accordance with – "Concrete Finish Schedule" included in this Section. The Engineer shall be the sole judge of acceptability of all such finish work.

a. Type "A" - Screeded: This finish shall be obtained by placing screeds at frequent intervals and striking off to the surface elevation required.

b. Type "B" - Scratched: Following completion of Type "A" finish, roughen the surface with stiff brushes or rakes before final set.

c. Type "C" - Floated: Following completion of Type "A" finish, do not work the concrete further until it is ready for floating. Begin floating with a hand float, a bladed power float equipped with float shoes, or a powered disc float as soon as the water sheen had disappeared and the surface has stiffened sufficiently to permit the operation. During or after the first floating, check flatness of surface with a ten (10) ft straightedge applied in two (2) or more directions. Eliminate high spots and low spots during this procedure to produce a conventional, straight edge finish, then refloat the slab immediately to a uniform texture.

d. Type "D" - Troweled: Following completion of a Type "C" finish and sufficient hardening of the concrete to prevent excess fine material from working to the surface, the surface shall be compacted and smoothed with a power trowel. Following the power trowel, hand trowel to provide a smooth, dense surface, free from defects, trowel marks, and blemishes. For surfaces exposed to wear as indicated in the Contract Documents, continue hand troweling until a ringing sound is produced as the floor is troweled.

e. Type "E" - Broom or Belt: This finish shall provide the surface with a transverse scored texture by drawing a broom or burlap belt across the surface immediately after completion of a Type "C" finish.

f. Type "F" - Liquid Hardened Finish: Liquid hardened finish shall be provided by application of a liquid floor hardener. Floors to receive this finish shall have previously received a Type "D" finish. Liquid hardener shall be applied between

thirty (30) to sixty (60) days after concrete placement. Surface to be treated shall be dry, clean and free of all loose dust, dirt, oil, wax, sealers and curing compounds. Application procedure shall be in accordance with manufacturer's instructions and shall consist of a three-coat treatment.

g. Type “G” - Dry Shake Hardened Finish: Aggregate hardened finish shall be provided by applying an aggregate floor hardener concurrently with the application of a Type “D” finish. Application procedure shall be in accordance with manufacturer's instructions.

h. Type “H” - Non-Slip Finish: This finish shall be provided by applying a non-slip shake-on aggregate concurrently with the application of a Type “D” finish. Application procedure shall be in accordance with manufacturer's instructions.

C. Sealing of Concrete Floor

1. After installation of all equipment and piping, and after completion of other related construction activities, all floor slabs which are to remain unpainted and not intended to be immersed, and all equipment pads, shall be sealed with a floor sealer unless the slab has had liquid hardener applied or stated otherwise. Remove all dirt, droppage, grease, asphalt or other foreign matter with caustics and detergents as required prior to application. Sealer shall be applied in accordance with the manufacturer's recommendations.

D. Finishes on Equipment Pads

1. Formed surfaces of equipment pads shall receive a Type II finish.

2. Top surfaces of equipment pads, except those surfaces subsequently required to receive non-shrink grout and support equipment bases, shall receive a Type "D" finish, unless otherwise noted. Surfaces which will later receive non-shrink grout shall, before the concrete takes its final set, be made rough by removing the sand and cement that accumulates on the top to the extent that the aggregate will be exposed with irregular indentations in the surface up to one-half (1/2) inch deep.

E. Concrete Finish Schedule

Item	Finish Type
All concrete surfaces not exposed to public view including utility spaces	I
All exterior surfaces and interior vertical surfaces exposed to public view	IV
All interior overhead surfaces exposed to public view and interior walls of tanks	II
Surfaces to be painted	III

Item	Finish Type
Architectural finish	V, VI, VII, or VIII as indicated in the contract documents
Surfaces to receive bonded cementitious mixtures	B
Drives, interior stairs, surfaces to receive waterproofing, roofing insulation, or terrazzo, and floors of tanks	C
Floors for walking surfaces in manufacturing, storage, and warehousing areas, and floors to receive coverings	D
Sidewalks	E
Garage and storage area floors	F or G
Exterior stairs, platforms, landings and ramps and interior ramps	E or H

3.3 FIELD TESTING / QUALITY CONTROL (NOT USED)

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 45 00
PRECAST STRUCTURAL CONCRETE

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 10 0 – Concrete Forming and Accessories

B. Section 03 21 00 – Reinforcing Steel

C. Section 03 30 00 – Cast-in-Place Concrete

D. Section 03 35 00 – Concrete Finishing

E. Section 03 60 00 – Grouting

F. Section 33 42 10 – Reinforced Concrete Sewer Pipe

1.3 PAYMENT

A. There will be no separate payment for the work specified herein.. The costs shall be considered incidental to the work and included in the prices bid for the various Contract items.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Definitions

1. Anchorage: A device used to anchor the tendon to the concrete member.

2. Bonded tendon: A prestressing tendon which is bonded to the concrete either directly or through grouting.

3. Coating: Material applied to unbonded tendons to protect them from corrosion; or material applied to either bonded or unbonded tendons to lubricate them during stressing.

4. Coupling: Any device designed to transfer the prestressing steel wires, bars or strands that comprise a tendon.

5. Element diameter: The diameter of the individual prestressing steel wires, bars, or strands that comprise a tendon.

6. Prestressing steel: That element of a post-tensioning tendon which is elongated and anchored to provide the necessary permanent prestressing force.

7. Sheathing: An enclosure in which post-tensioned tendons are encased to prevent bonding during concrete placement, such as a paper plastic jacket for unbonded tendons, or metal conduit for bonded tendons.

8. Tendon: An assemblage of steel elements such as wire, bar, or strand, complete with anchorage or anchorage devices used to impart prestress to concrete when the assembly is tensioned.

9. Unbonded tendon: A tendon which is not bonded to the concrete.

B. Reference Standards:

1. ASTM A 36 - Carbon Structural Steel.

2. ASTM A 53 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

3. ASTM A 276 - Stainless and Heat-Resisting Steel Bars and Shapes.

4. ASTM A 416 - Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.

5. ASTM A 615/A- Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

6. ASTM A 666 - Austenitic Stainless Steel, Sheet, Strip, Plate and Flat Bar for Structural Application.

7. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field.

8. ASTM C 33 - Concrete Aggregates.

9. ASTM C 76 - Precast Concrete Inlets, Headwalls, and Wingwalls

10. ASTM C 109 - Test Method for Compressive Strength of Hydraulic Cement Mortars.

11. ASTM C 138 - Test Method for Unit Weight, Yield, and Air Content of Concrete.

12. ASTM A 143 - Test Methods for Slump of Hydraulic Cement Concrete.

13. ASTM C 150 - Portland Cement.

14. ASTM C 185 - Test Method for Air Content of Hydraulic Cement Mortar.

15. ASTM C 191 - Test Method for Tensile Strength of Hydraulic Cement Mortars.

16. ASTM C 260 - Air-Entraining Admixtures for Concrete.

17. ASTM C 330 - Lightweight Aggregates for Structural Concrete

18. ASTM C 494 - Chemical Admixtures for Concrete.

19. ASTM F 3125 - High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi & 150 ksi Minimum Tensile Strength, Inch and Metric Dimensions.

20. ACI 318 - Building Code Requirements for Reinforced Concrete

21. ACI 350 - Code Requirements for Environmental Engineering Concrete Structures.

22. AWS D1.1 and D1.4 - Structural Welding Codes - Steel Reinforcing Steel.

23. AWS D1.6 - Structural Welding Code – Stainless Steel.

24. AASHTO - AASHTO Standard Specifications for Highway Bridges.

25. Building Code of the City of New York.

26. PCI-MNL-116 - Precast and Prestressed Concrete Institute, "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products".

27. PCI-MNL-120 - Precast and Prestressed Concrete Institute, “Manual for PCI Design Handbook”, latest edition.

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. The Contractor shall submit Shop Drawings and reference materials for the approval of the Engineer. Submittals shall include, but not be limited to:

1. Placing Drawings for manufacture and erection of precast, prestressed concrete units and provide the following information in addition to that required by Section 03 10 00 – Concrete Forming and Accessories and Section 03 21 00 – Reinforcing Steel.

2. Unit shapes, including elevations and sections, member piece marks and dimensions.

3. Plans and elevations locating and defining all products furnished by the manufacturer.

4. Finishes.

5. Relationship to adjacent materials.

6. Reinforcement, joint and connection details.

7. Erection sequence and handling requirements.

8. The location of tendons and sheathing throughout their length.

9. Size, details, location, materials, and stress grade (where applicable) for all tendons and accessories.

10. Jack clearances, jacking procedures, stressing sequence, initial tensioning forces, gauge pressures, and tendon elongation.

11. Locations and type of lifting and erection inserts. Certified reports for lifting inserts indicating allowable design loads shall also be submitted.

12. All dead, live and applicable loads and design criteria. When design is not detailed on the Contract Drawings, drawings shall be stamped by a Licensed New York State Professional Engineer.

13. Location, dimensional tolerances, and details of anchorage devices that are embedded in or attached to structure or other construction.

14. Other items cast into units.

15. Handling procedures, plans, and/or elevations showing precast, prestressed concrete unit location and sequence of erection and lifting for special conditions.

B. Preliminary Data - The following information shall be submitted:

1. Typical stress-strain curve of the prestressing steel.

2. Test results of ultimate strength, yield strength, elongation, and composition for all material not produced in accordance with an ASTM specification.

3. Structural design calculations by a New York State Professional Engineer.

4. Values of the wobble coefficient and the curvature coefficient, and anchorage seating device set data.

5. Test data substantiating the expected coefficients and anchorage slip.

C. Field Data – The following information, prior to installation on actual materials to be used, shall be submitted:

1. Stress-strain curve for a sample representing the production lot from which the prestressing tendons will be taken.

2. Notarized mill test reports for the tendons.

3. Results of all tests required in Paragraph 1.7C.2 including compliance with Paragraphs 2.2H to 2.2J for anchorage and couplings.

D. 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.

2. Sample size: twelve (12) inches by twelve (12) inches by thickness indicated on the Contract Drawings, representative of the proposed finished product.

E. Quality Control Submittals: The following items shall be submitted:

1. Concrete mix designs.

2. Reports for all test results in compliance with the requirements of Paragraph 1.6(D).

3. Air content tests and test reports for laboratory cured concrete cylinders in accordance with the requirements of Section 03 30 00 - Cast-in-Place Concrete.

4. Independent laboratory tests for grout shall be in accordance with the requirements of Section 03 60 00 - Grouting. Grout exposed to the weather shall be free of discoloration and shall not require special surface treatments.

5. Design calculations for pranks, wall panels, head walls, wing walls, slabs, troughs, structural concrete members and coping prepared and sealed by a Professional Structural Engineer licensed in the State of New York.

F. Identify the percentage of recycled material used within the concrete mix design. Twenty percent (20%) of the cementitious material shall be fly ash, or, forty percent (40%) of the cementitious material shall be slag cement; see Table 1 at the end of Section 03 30 00 – Cast-in-Place Concrete.

G. Identify the percentage of concrete materials in accordance with the regional content requirements. Ninety percent (90%) of concrete materials shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

Material	**Distance from the Site Requirement**
Aggregates, Sands	50 miles
Concrete Plants	100 miles

1.7 QUALITY CONTROL

A. A qualified precast, prestressed concrete manufacturer and erector shall meet the requirements of PCI-MNL-116.

1. All manufactured precast, prestressed concrete units shall be produced by an experienced manufacturer regularly engaged in the production of such items. All manufactured precast, prestressed concrete and site-cast units shall be free of defects, checks, and cracks. Care shall be taken in the mixing of materials, casting, curing and shipping to avoid any of the above. The Engineer may elect to examine the units at the casting yard or upon arrival of the same at the Site. The Engineer shall have the option of rejecting any or all of the precast, prestressed work if it does not meet with the requirements specified herein or on the Contract Drawings. All rejected work shall be replaced at no additional cost to the DEP.

2. The precast, prestressed concrete manufacturing plant shall be certified by the Prestressed Concrete Institute, Plant Certification Program, prior to the start of production. In lieu of such certification, the manufacturer, at his expense, shall meet the following requirements:

a. Retain independent testing or consulting firm approved by the Engineer and/or DEP.

b. Perform basis of inspection in accordance with the requirements of PCI-MNL-116.

c. Precast, prestressed plant shall be inspected at two (2) week intervals during production and issue a report, certified by a registered engineer verifying that materials, methods, products and quality control meet all the requirements of the specifications, Contract Drawings, and PCI-MNL-116. If the report indicates to the contrary, the engineer, at the precaster's expense, will inspect and may reject any or all products produced during the period of non-compliance with the above requirements.

B. Plant production and engineering shall be under direct supervision and control of an engineer who possesses a minimum of five (5) years of experience in precast, prestressed concrete work.

C. A qualified welder shall meet the requirements of ANSI/AASHTO/AWS Structural Welding Code, D1.1.

D. Quality Assurance

1. Materials shall be tested in accordance with the following requirements. Detailed description of test procedures and apparatus, as well as test results shall be included in the report.

2. Assembly shall be tested in accordance with Paragraphs 1.06D.3 and 1.06D.4 below, on a third sample for tendons that are not bonded, two (2) samples of each tendon size at least ten (10) ft in length and complete with standard production quality anchorages.

3. Prestressing steel sample shall be tested in accordance with the appropriate ASTM Specification of Paragraph 2.2C.1. Tendon assembly shall be tested with a method that will allow accurate determination of the yield strength, ultimate strength, and elongation of the specimen to ensure compliance with Paragraphs 2.2E, or 2.2H and 2.2J.

   a. For unbonded tendons, a dynamic test shall be performed on a representative tendon assembly which shall withstand without failure five-hundred thousand (500,000) cycles from sixty (60) to sixty-six (66) and back to sixty percent (60%) of its guaranteed minimum ultimate strength. A prototype tendon assembly may be used provided the assembly has not less than ten percent (10%) of the full size tendon strength. Single element tendons using one (1) strand, bar, or wire shall be tested as a complete tendon assembly. Systems utilizing multiple strands, wires, or bars may be tested using a prototype tendon with sufficient number of elements to duplicate the behavior of a full-sized tendon.

   b. Grout shall be tested for strength and shrinkage in accordance with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 03 60 00 - Grouting.

4. Following tolerances shall be complied with:

   a. The bearing surface between anchorage and concrete shall be concentric with the tendons and perpendicular to the intended direction of the tendon within ± one (1) degree.

   b. Tendons, sheathing, and anchorage shall be placed within the tolerances of ACI 117 for reinforcement placement, distance between reinforcement, and concrete cover as noted on the Contract Drawings. These tolerances shall apply separately to both vertical and horizontal dimensions and may be different for each direction except that in slabs the horizontal tolerance shall not exceed one (1) inch in fifteen (15) ft of tendon length.

1.8 DESCRIPTION

A. Performance Requirements

1. Load Calculations: Precast, prestressed 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 except as shown on the Contract Drawings. Structural properties of the units shall be calculated in accordance with ACI 318.

2. Dimensions and Tolerances: Precast, prestressed units shall be fabricated to dimensional tolerances in accordance with PCI-MNL-120.

a. Units shall be designed to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

1.9 DELIVERY, STORAGE, AND HANDLING

A. All precast, prestressed structural 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. All precast, prestressed concrete units shall be delivered to the Project Site in such quantities and at such times to maintain continuity of erection.

2. Precast, prestressed members shall not be transported away from the casting yard until the concrete has reached the minimum required twenty-eight (28) day compressive strength and a period of at least five (5) days has elapsed since casting, unless otherwise permitted by the Engineer.

a. Precast, prestressed members shall not be transported from the plant to the job Site prior to approval of that member by the plant inspector. This approval will be stamped on the member by the plant inspector.

3. 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.

4. Transportation, Site handling and erection shall be accomplished using acceptable equipment and methods by qualified personnel so that units shall not be damaged.

5. During handling, transporting, and storing, precast, prestressed concrete members shall be lifted and supported only at the lifting or supporting points as indicated on the Shop Drawings.

6. Nonstaining resilient spacers of even thickness shall be placed between each unit.

7. Units shall be supported during shipment and storage on nonstaining shock-absorbing material.

8. 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, prestressed 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.

9. Factory assembled parts and components shall not be dismantled for shipment unless written permission is received from the Engineer.

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS (NOT USED)

2.2 MATERIALS / EQUIPMENT

A. Concrete shall conform to the requirements of Section 03 30 00 - Cast-in-Place Concrete with the color and finish matching that for structural concrete.

1. For precast and prestressed concrete items, minimum compressive strength of concrete at twenty-eight (28) days shall be five-thousand (5,000) psi unless otherwise specified in the Contract. Minimum compressive strength of concrete at transfer of prestressing force shall be three-thousand and five- hundred (3,500) psi unless otherwise specified.

B. Concrete reinforcement shall conform to the requirements of the DEP Standard Specifications for On-Site Green Infrastructure Section 03 21 00 - Reinforcing Steel.

C. Prestressing Strands:

1. Prestressing strands shall be seven (7)-wire, stress-relieved, high-strength strands Grade 250K or 270K in conformance with one (1) of the following: ASTM A 416, ASTM A 421 and ASTM A 722.

Strands, wire, and bars not specifically listed in ASTM A 416, ASTM A 421, or ASTM A 722 are permitted to be used provided they conform to the minimum requirements of this Section and do not have properties that make them less satisfactory than those listed in ASTM A 416, ASTM A 421, or ASTM A 722.

2. Tendons shall be clean and free of excessive rust, scale, and pitting. A light oxide coating is permissible.

D. Grease, wax, plastic, or bituminous material may be used as coating material for unbonded tendons. Throughout the range of temperatures anticipated for the structure, the coating material shall remain ductile and free from cracks and shall not become fluid. The coating shall be chemically non-reactive with the tendon, concrete, and the material used for sheathing. The coating shall adhere to and be continuous over the entire tendon length to be unbonded.

E. Sheathing for Bonded Tendons

1. Sheathing and duct-forming materials shall not react with alkalies in the cement, shall be strong enough to retain their shape and resist damage during construction, and shall prevent the intrusion of cement paste from the concrete. Sheathing and duct-forming material left in place shall not cause electrolytic action or deterioration.

2. The inside diameter of the sheathing or duct shall be at least one-fourth (1/4) inch larger than the wire, bar, or strand tendon and shall have an inside cross-sectional area at least twice that of the net area of the tendon.

3. Sheathing shall have grout holes or vents at each end and at all high points except where curvature is small and the sheathing as determined by the Engineer is relatively level. Drain holes shall be provided at all low points if the tendon may be subjected to freezing after placing and before grouting.

F. Sheathing for unbonded tendons shall have sufficient tensile strength and water resistance to prevent damage or deterioration during transportation, storage at job Site, and installation. The sheathing shall be continuous over the unbonded length of the tendons. The sheathing shall prevent the intrusion of cement paste and the escape of coating material. The sheathing may be a continuous tube or spiral wrapping.

G. Sheathing at joints shall be connected with leak-tight sleeves or gaskets.

H. Bonded tendon anchorage tested in an unbonded state shall develop ninety percent (90%) of the minimum specified ultimate strength of the prestressing steel, without exceeding anticipated set at time of anchorage, and without slip. Anchors which develop less than one-hundred percent (100%) of the minimum specified ultimate strength shall be applied only where the bond length is equal to or greater than, the bond length required to develop one-hundred percent (100%) of the minimum specified ultimate strength of the tendon. The required bond length between the anchorage and the zone where the full prestressing force will be developed under service and ultimate loads shall be provided. Bond length shall be determined by testing a full-sized tendon. If in the unbonded state, the anchorage develops one-hundred percent (100%) of the minimum specified ultimate strength, it need not be tested in the bonded state.

I. Unbonded tendon anchorages when permitted by the Engineer shall develop the minimum specified ultimate strength of the prestressing steel with an amount of permanent deformation which will not decrease the expected ultimate strength of the assembly. The total elongation under ultimate load of the tendon shall be not less than two percent (2%) when measured over a minimum gage length of ten (10) feet.

J. Couplings shall be used only at locations indicated on the Contract Drawings. All couplings shall develop the minimum specified ultimate strength of the prestressing steel without exceeding anticipated set of either the coupling or the prestressing steel, and shall not reduce the ductility of the tendon below the minimum two percent (2%) strain specified in Paragraph 2.2.I. Couplings in housings which permit necessary movements during stressing shall be enclosed. For bonded tendons, fittings shall be provided to allow complete grouting of all the coupling components.

K. Grout shall conform to Section 03 60 00 - Grouting.

L. Bearing pads shall be provided as shown on the Contract Drawings.

1. Elastomeric Bearing Pads:

a. Elastomeric bearing pads shall be of new neoprene compound. Pads shall be cast under heat and pressure and may be individually molded or cut from pressure-cast stock having a nominal durometer hardness of seventy (70) (for non-laminated pads).

b. Variations from the dimensions shown on the Contract Drawings shall not be more than the following: thickness, +/-1/16 inch; width, minus one- eighth to plus one-fourth (-1/8 to +1/4) inch; length, minus one-eighth to plus one-fourth (-1/8 to +1/4 inch). Tolerances, dimensions, finish and appearance, and flash shall conform to the requirements of A 4-F3-T.063- B2, Grade 2, Method B, in accordance with the RMA Rubber Handbook.

c. Pads shall be furnished in one (1) piece and shall not be laminated unless otherwise specified. Pads shall be furnished in identifiable packages.

d. Adhesive for use with elastomer pads shall be an epoxy-resin compound compatible with the elastomer having a sufficient shear strength to prevent slippage between pads and adjacent bearing surfaces. Adhesive shall be twenty (20)+F Contact Cement by Miracle Adhesives Corporation, Neoprene Adhesive 77-198 by IGI Adhesives, Sikadur 31, Hi-Mod Gel by Sika Corporation, or DP-605 NS Urethane Adhesive by 3M Adhesive Systems, or approved equal.

2. Plastic bearing pads shall be multi-monomer plastic strips which are non-leaching and support construction loads with no visible overall expansion, manufactured specifically for the purpose of bearing precast, prestressed concrete.

M. Fine and coarse aggregates for exposed finish shall be obtained from a single source for the entire job. Aggregate shall be clean, hard, strong, durable and inert, shall be free of staining or deleterious material and shall conform to ASTM C 33.

N. Anchors, clamps, dowels and similar ties for anchoring precast, prestressed concrete shall be of Type 316 stainless steel, of the sizes and types shown.

O. Mortar shall conform to the Contract Documents and shall match adjacent masonry work.

2.3 FABRICATION / ASSEMBLING / FINISHES

A. Fabrication

1. Structural precast, prestressed concrete units shall be manufactured in accordance with PCI-MNL-116.

2. Cover for reinforcing steel shall be a minimum of three-fourth (3/4) inch. Metal chairs, with or without coating, shall not be used on the finished face.

3. Because of the critical nature of the bond development length in prestressed concrete unit construction, if the transfer of stress is by burning of the fully tensioned strands at the ends of the member, each strand shall first be burned at the ends of the bed and then at each end of each member before proceeding to the next strand in the burning pattern.

4. Rigid molds shall be used to maintain units within specified tolerances conforming to the shape, lines and dimensions shown on the approved shop drawings. Molds shall be constructed to withstand vibration method selected.

5. 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.

6. Precast, prestressed concrete units shall be cured in accordance with 03 30 00 - Cast-in-Place Concrete 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.

7. Each precast, prestressed concrete unit shall be marked corresponding to identification mark on Shop Drawings for unit location. Each precast, prestressed concrete unit shall be marked with the date of casting.

8. Structural precast, prestressed concrete units which do not meet the color and texture range or the dimensional tolerances shall be rejected if they cannot be satisfactorily corrected.

9. The Contractor shall coordinate the communication of all necessary information concerning openings, sleeves, or inserts to the manufacturer of the precast, prestressed members.

10. Finishing shall be in accordance with Section 03 35 00 - Concrete Finishing.

2.4 SOURCE QUALITY CONTROL / SHOP TESTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION

A. The Contractor shall verify that areas to receive precast, prestressed structural concrete units are properly prepared and completed to final elevations as shown on the Contract Drawings.

3.2 IMPLEMENTATION

A. Installation

1. Structural precast, prestressed concrete shall be installed in accordance with the manufacturer's recommendations and approved Shop Drawings.

2. Precast, prestressed concrete units shall be set level, plumb, square and true within allowable tolerances in accordance with PCI-MNL-120 and as noted herein.

3. Temporary supports and bracing shall be provided as required to maintain position, stability and alignment as units are being permanently connected.

4. Non-loadbearing units shall be set dry without mortar. Specified joint dimensions shall be attained with steel or plastic spacing shims.

5. Precast, prestressed concrete units shall be fastened in place by bolting or welding or both, completing dry-packed joints, grouting sleeves and pockets, and placing cast-in-place concrete joints as indicated on the approved erection drawings. Precast, prestressed concrete units shall be fastened in place in accordance with details shown on the Contract Drawings.

6. Temporary lifting and handling devices cast into the precast, prestressed 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.

7. All anchors, clamps, dowels and similar ties shall be furnished and set for proper erection.

8. All joints shall be a uniform thickness as shown on the Contract Drawings.

B. Placement and Protection of Tendons and Accessories

1. A visual inspection shall be conducted to ensure that materials meet requirements of the Section. The inspection shall include, but not be limited to, the following:

   a. Cleanliness of material and forms

   b. Location of materials and forms

   c. Proper tensioning of prestressing materials

2. Preparation

   a. A dependable high-pressure water supply of sufficient volume before beginning grouting shall be provided. Sheathing shall be freed of dirt and other foreign substances by thorough flushing with water immediately prior to grouting.

b. Tendons and Concrete

1) Tendons shall be kept dry and water shall be kept out of the conduit until flushing tendons prior to grouting. Concrete around grouted tendons shall be maintained at a temperature of forty (40) ºF or higher from the time of grouting to at least three (3) days after grouting.

2) Sheathing for use with bonded tendons shall be kept free of grease, oil, paint, and other foreign matter. A light coat of rust is permissible, provided loose rust has been removed and the surface of the steel is not pitted.

3) Tendons for use in unbonded construction shall be kept clean and undamaged, and protected with a permanent coating specified in Paragraph 2.2D.

4) Tendon shall be covered with an additional field-applied coating of acceptable material.

5) End anchorage shall be permanently protected with concrete free of loose rust, grease, oil, and other foreign matter except paint.

6) Grout fittings and sheathing for bonded tendons shall be protected from collapse and other damage. Prior to placing concrete, sheathing and grout fittings shall be examined for holes, and any holes found shall be repaired. If the tendon remains ungrouted for more than twenty-eight (28) days from the time of tendon placement, temporary corrosion protection shall be provided.

3. Placement

a. Tendons and anchorage shall be installed to meet tolerances of Paragraph 1.7 D.4. Tendons, sheathing, and anchorage shall be firmly supported to prevent displacement during concrete placement.

b. Grout

1) For bonded-tendon construction, grout shall be injected into all voids between prestressing tendons, sheathing, and anchorage fittings. Flow shall be continued until grout of the same consistency as the grout injected flows without the presence of air bubbles from vent openings. Vent openings shall be closed progressively in the direction of the flow. After all vent openings have been closed, the grouting pressure shall be raised to at least fifty (50) psi and plug the injection hole.

2) In the event of a blockage or an interruption of grouting, all grout shall be removed from the tendon sheath by flushing with water.

4. Tensioning and Other Operations Involving Tendons

a. Tendons shall be stressed in the sequence, at the concrete strength, and at the construction stage as indicated on the Contract Drawings.

b. Tendons composed of multiple strands, wires, or bars in a common sheath shall be tensioned simultaneously unless the effects of interference between the elements are considered.

c. Prestressing force shall be determined by measuring tendon elongation and checking jack pressure with a calibrated gauge or dynamometer. Gauge or dynamometer shall be calibrated within six (6) months prior to use; correct any discrepancy which exceeds five percent (5%). Elongation requirements shall be based on load-elongation curves for the steel used. For each tendon a record of the measured elongation and the gauge pressure or dynamometer readings shall be kept and submitted to the Engineer.

d. The total loss of prestress force in any tendon due to unreplaced broken elements shall not exceed two percent (2%) of the total prestress force.

e. Tendons shall not be subjected to excessive temperatures, welding sparks, or electric ground currents. Burning and welding operations shall not be conducted in the vicinity of tendons without prior acceptance, except as permitted by Paragraph 3.2 B. 4. f.

f. Superfluous extension of tendons beyond anchorage may be removed by rapid oxyacetylene burning, unless these procedures are contrary to the recommendations of the manufacturer of the prestressing steel.

C. Repair

1. Concrete shall be repaired in accordance with the requirements of Section 03 30 00 - Cast-in-Place Concrete. Where required, and subject to the approval of the Engineer, damaged exposed exterior surfaces shall be repaired to match color and texture of surrounding concrete and to minimize shrinkage.

D. Cleaning

1. After installation and joint treatment, precast, prestressed 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, prestressed concrete manufacturer's recommendation. Cleaning materials and processes shall be used which will not change the character or color of exposed concrete finishes.

3.3 FIELD TESTING / QUALITY CONTROL (NOT USED)

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP

CONTRACT GI-CONS-7
SECTION 03 45 00
PRECAST STRUCTURAL CONCRETE

A. Protection

1. Precast, prestressed structural concrete units shall be protected from all damage and abuse from all other Contractors and installers involved in the work until Final Acceptance by the DEP.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 03 60 00
GROUTING

PART 1 GENERAL

1.1 REQUIREMENTS (NOT USED)

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 30 00 - Cast-in-Place Concrete.

1.3 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm Cube Specimens).

B. ASTM C531 - Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts and Monolithic Surfacings.

C. ASTM C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings.

D. ASTM C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).

E. ASTM C1107 - Packaged Dry, Hydraulic Cement Grout (Nonshrink).

F. CRD-C 621 - Corps of Engineers Specification for Non-shrink Grout.

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. The Contractor shall submit Shop Drawings and material specifications for the approval of the Engineer. Shop drawings shall include, but not be limited to:

1. Material certifications and technical data sheets.

2. Samples of all materials to be used.

3. For cement grout produced at a ready mix plant submit a cement grout mix design in accordance with Section 03 30 00 – Cast-in-Place Concrete.

B. The Contractor shall also submit the following:

1. Certified test results verifying the compressive strength, shrinkage and expansion requirements specified herein.

2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the Work.

C. Identify the percentage of recycled material used within grouting material. Twenty percent (20%) of grouting materials shall be of recycled content.

D. Identify the percentage of grouting materials in accordance with the regional content requirements. Ninety percent (90%) of grouting materials shall meet the regional content requirements below:

1. Regional content shall be defined per material by a distance from the Site requirement in radii from the Project Site, as listed in Table A.

Table A: Regional Content Requirements

Material	**Distance from the Site Requirement**
Grouting Materials	500 miles

1.7 QUALITY CONTROL

A. Testing Agency:

1. Testing of materials and of resulting grout for compliance with the technical requirements of the specification will be performed by QA/QC consultant employed and paid by the DEP.

a. The Contractor shall be charged by the DEP for the cost of any additional tests and investigation on work performed which does not meet the Specifications.

1.8 DESCRIPTION

A. Services of Manufacturer’s Representative

1. The Contractor shall provide the services of a qualified manufacturer's technical representative who shall instruct the Contractor's personnel in the mixing, proper use and application of the non-shrink grout and epoxy grout.

2. The manufacturer's representative shall provide written certification that materials have been mixed and applied properly and surfaces to receive these products have been prepared properly, all in conformance with manufacturer's requirements.

3. The on-site time required for the manufacturer's representative to achieve a successful installation shall be at the expense of the Contractor. The

manufacturer's representative shall sign in and out at the office of the Resident Engineer and provide written verification of the areas he has approved on each day he is at the Project.

B. Grout Uses

1. The different types of grout shall be used for the applications stated below unless noted otherwise specified herein or on the Contract Drawings. Where grout is called for in this Section or on the Contract Drawings which does not fall under any of the applications stated below, non-shrink grout shall be used.

   a. Cement grout shall be used for grout toppings and for patching of fresh concrete.

   b. Non-shrink grout shall be used for grouting beneath base plates of equipment and structural metal framing.

   c. Epoxy grout shall be used for bonding new concrete to hardened concrete.

2. New concrete surfaces to receive cement grout shall be as specified in DEP Standard Specifications for On-Site Green Infrastructure Section 03 30 00 – Cast-in-Place Concrete, and shall be cleaned of all dirt, grease and oil-like films.

   a. Existing concrete surfaces shall likewise be cleaned of all similar contamination and debris, for protection of cement grout shall be as specified in Section 03 30 00 – Cast-in-Place Concrete.

   b. Curing and protection of cement grout shall be as specified in Section 03 30 00 – Cast-in-Place Concrete.

3. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING (NOT USED)

1.10 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES (NOT USED)

1.11 SPECIAL WARRANTY PROVISIONS / GUARANTEE PERIODS (NOT USED)

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Epoxy grout:

1. Sikadur 32 Hi-Mod as manufactured by Sika Corporation, Lyndhurst, NJ.

2. Euco #452 as manufactured by Euclid Chemical, East Brunswick, NJ.

3. Duralcrete LV as manufactured by Tamms Industries, Kirkland, IL.

4. Or approved equal.

B. Non-shrink grout shall be:

1. Euco N-S as manufactured by Euclid Chemical Company, East Brunswick, NJ.

2. Masterflow 713 as manufactured by Master Builders Solutions, Shakopee, MN.

3. Sikagrout 212 as manufactured by Sika Corporation, Lyndhurst, NJ.

4. Or approved equal.

2.2 MATERIALS / EQUIPMENT

A. Cement Grout

1. Cement grout shall be composed of Portland cement, sand and water. The sand to be used shall be selected to suit the spacing for placement. Where sand is not usable, the grout shall be composed of cement and water only.

2. Gradation of sand and mix proportioning shall be in accordance with the following table for grouts using natural sands and having a minimum twenty-eight (28) day compressive strength of four-thousand (4,000) psi. For higher strength grouts or those using manufactured sands, strength shall be established by trial mixes.

a. Gradation for Natural Sand:

Sieve Size	Spaces less than one (1) inch	Spaces one (1) inch or more
Passing 3/8		100
Passing 4	100	95-100
Passing 8	**95-100**	80-100
Passing 16	70-100	50-85
Passing 30	40-75	25-60
Passing 50	10-35	10-30
Passing 100	2-15	2-10
Passing 200	--	--

b. Mix Proportioning:

By Weight	Non-Air Entrained Grouts (Maximum 4 Percent Entrapped Air)		Air Entrained Grouts (Air 8 Percent to 10 Percent)	
	Spaces less than one (1) inch	Spaces one (1) inch or more	Spaces less than one (1) inch	Spaces one (1) inch or more
Cement (bags)	10.8	10.5	11.3	11.0
Sand (lb)	2150	2240	1930	1990
Maximum water (gals)	59.5	57.8	57.5	55.8
Maximum water (gals per bag)	5.5	5.5	5.1	5.1

By Volume	Non-Air Entrained Grouts (Maximum 4 Percent Entrapped Air)		Air Entrained Grouts (Air 8 Percent to 10 Percent)	
	Spaces less than one (1) inch	Spaces one (1) inch or more	Spaces less than one (1) inch	Spaces one (1) inch or more
Cement	1	1	1	1
Sand (dry rodded)	1.85	2.10	1.6	1.7
Sand (damp & loose)	2.30	2.35	2.0	2.1
Maximum water (gals per bag)	5.5	5.5	5.1	5.1

3. Water shall be kept to a minimum, the amounts noted in the preceding table are the maximum for grout. Proportioning by volume shall be limited to small quantities mixed at the job Site.

4. White Portland cement shall be mixed with the Portland cement as required to match the color of adjacent concrete.

B. Non-Shrink grout

1. The grout material shall be an approved ready to use mixture requiring only water for use at the job Site. The compressive strength of two (2) inch cubes shall be three-thousand (3,000) psi at seven (7) days.

2. Non-shrink grout shall conform to CRD-C 621 and ASTM C1107, Grade B or C when tested at a maximum fluid consistency of thirty (30) seconds per ASTM C939 at temperature extremes of forty-five (45) degrees Fahrenheit and ninety (90) degrees Fahrenheit and an extended working time of fifteen (15) minutes.

3. Non-shrink grout product and manufacturer shall be as specified in this Section.

4. Non-shrink grouts depending on oxidation to limit shrinkage and containing additives such as iron or steel particles shall not be used.

C. Epoxy Grout

1. Epoxy grout shall be modified as required for each particular application with aggregate per manufacturer's instructions.

2. Epoxy grout product and manufacturer shall be as specified in this Section.

D. Dry Pack

1. Dry pack (to be packed or tamped in place) shall be made at no slump consistency.

2. When mixing the batch, only enough water shall be added to the dry materials to produce a rather stiff mixture, then additions of water may be made in small increments until the desired consistency is obtained.

E. Curing Materials

1. Curing materials for cement grout shall be as specified in Section 03 30 00 – Cast-in-Place Concrete and as recommended by the manufacturer for prepackaged grouts.

2.3 FABRICATION / ASSEMBLING / FINISHES (NOT USED)

2.4 SOURCE QUALITY CONTROL / SHOP TESTS (NOT USED)

CONTRACT GI-CONS-7
SECTION 03 60 00
GROUTING

PART 3 EXECUTION

3.1 EXAMINATION / PREPARATION (NOT USED)

3.2 IMPLEMENTATION

A. Installation

1. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency shall be such that the grout is plastic and moldable but will not flow.

2. Measurements for cement grout shall be made accurately by weight or by volume using containers. All measurements shall be made in a manner satisfactory to the Engineer. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

3. Grout shall be placed quickly and continuously, shall completely fill the space to be grouted, be thoroughly compacted and free of air pockets. The grout may be poured in place, pressure grouted by gravity, or pumped.

4. For grouting beneath base plates, grout shall be poured from one side only and shall flow across to the open side to avoid air-entrapment.

5. The use of pneumatic pressure or dry-packed grouting requires approval of the Engineer.

3.3 FIELD TESTING / QUALITY CONTROL

A. Field Tests:

1. Compression test specimens will be taken during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to ensure continued compliance with these Specifications.

2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C109 at intervals during construction as selected by the Engineer. A set of three (3) specimens will be made for testing at seven (7) days, twenty-eight (28) days and any additional time period as appropriate.

3. Compression tests and fabrication of specimens for epoxy grout shall be performed as specified in ASTM C579, Method B, at intervals during construction as selected by the Engineer. A set of three (3) specimens will be made for testing at seven (7) days and any other time period as appropriate.

B. All grout which has already been placed and which fails to meet the requirements of this Section is subject to removal and replacement by the Contractor at no additional cost to the DEP.

3.4 STARTUP / DEMONSTRATION (NOT USED)

3.5 ADJUSTING / PROTECTION / CLEANUP (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 04 05 00
COMMON WORK RESULTS FOR MASONRY

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes brick and Portland Cement Mortar for use in manholes and drainage inlets.

1.02 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM C32 - Standard Specification for Sewer and Manhole Brick

B. Section 03 30 00 – Cast-in-Place Concrete

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit Shop Drawings and material specifications for the approval of the Engineer. Shop drawings shall include, but not be limited to:

1. Material certifications and technical data sheets.

2. Samples of all materials to be used.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MATERIALS

A. Brick must be made from clay or shale and burned so that they are free from cracks, warpage and exposed stones, pebbles or particles of lime.

B. The brick shall be Type 1 – Manhole Brick and General Masonry Use and Construction.

C. Brick must be of standard size as approved.

D. Brick need not be branded.

E. Portland Cement Mortar:

1. Mortar shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

2. Unless otherwise specified, mortar shall be either Non-Air Entrained Mortar (maximum 4% entrapped air) for spaces less than one (1) inch or Non-Air Entrained Mortar (maximum 4% entrapped air) for spaces one (1) inch or more as specified by mortar bedding or joint requirements. (Section 03 30 00 – Cast-in-Place Concrete.)

2.02 CHEMICAL AND PHYSICAL REQUIREMENTS

A. Except as otherwise provided herein, brick must comply with ASTM C32, Grade MS.

B. Mortar shall consist of sand mixed with Portland Cement, water and additives when required in definite proportions so as to produce a stiff mixture. Proportions shall be in accordance with Standard Specifications for On-Site Green Infrastructure 03 30 00 – Cast-in-Place Concrete.

C. Portland Cement shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete. Type II cement shall be used unless otherwise specified.

D. Sand for mortar shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

E. Water shall be drawn from mains owned by or supplying water to the City of New York.

2.03 VISUAL INSPECTION

A. Brick will be subjected to visual inspection. Individual imperfect brick will be rejected for any of the following causes:

1. Defects - The presence of cracks, warpage, stones, pebbles or particles of lime that would affect the serviceability of the brick.

2. Irregular Shape - Brick not of rectangular cross-section with substantially straight square corners or where ends and at least one (1) edge do not have plain surfaces.

3. Variation in Size - Brick which vary from specified size by more than plus or minus one-eighth (1/8) inch in either transverse dimension or by more than plus or minus one-quarter (1/4) inch in length.

4. Variation from Approved Samples - Brick may vary from the standard of comparison as established from the approved samples.

2.04 REJECTION

A. Approximately one (1%) percent of each type of brick will be taken at random for visual inspection. If five (5%) percent of the sample is not acceptable on the basis of visual inspection, the entire delivery shall be rejected. The Contractor, however, may cull such a delivery at the Contractor's own expense and resubmit the delivery for acceptance.

B. Brick may be inspected either (a) at the place of manufacture, or (b) at the dock or siding as unloaded, before delivery on the street, or (c) at both locations. All deliveries will be subjected to further inspection at the place of use, and brick that do not comply with the specification requirements will be rejected.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS, BRICK MASONRY

A. The bricks must be wet when laid and each brick must be laid in cement mortar so as to form full bed, end and side joints at one operation. The joints must not be wider than three-eighth (3/8) inch, except when the bricks are laid radially, in which case the narrowest part of the joint must not exceed one-quarter (1/4) inch. Brickwork must be smoothly coated both inside and outside with a layer of cement mortar one-half (1/2) inch thick. Brickwork must be laid with a satisfactory bond, and as the Work progresses, the bricks will be racked back in courses, unless otherwise permitted. No brickwork shall be laid or re-laid when the temperature is below 25 degrees F.

B. All fresh brickwork must be carefully protected from freezing and from the drying effects of the sun and wind, and if required, the brickwork must be sprinkled with water at such intervals and for such time as may be directed. Brickwork must be protected from injuries of all sorts, and all portions that may become damaged or may be found defective must be repaired or if directed, be removed and rebuilt. In freezing weather, the bricks must be heated sufficiently to remove all ice and frost before placement.

3.02 MANUFACTURE OF CEMENT MORTAR

A. PROPORTIONING INGREDIENTS:

1. The materials shall be measured in accordance with Section 03 30 00 – Cast-in-Place Concrete.

B. MIXING INGREDIENTS:

1. Mortar shall be mixed in a suitable box or on a tight platform, and never upon pavement or ground. Cement and Sand shall be thoroughly mixed dry, until the mixture has a uniform color. Clean, fresh water shall then be added and the mass worked until a mortar, which is uniform and of the required consistency, is produced. Mortar shall be mixed in no greater quantity than is required for the work in hand. Mortar that has set sufficiently to require re-tempering shall not be used.

2. When required by the Engineer, ingredient materials, after measuring, shall be mixed in an approved rotating drum type batch mixer. Mixing shall be for a period of not less than one and one-half (1-1/2) minutes at a rate of not less than fourteen (14) nor more than twenty-two (22) revolutions per minute and shall be continued until a homogeneous mixture is produced. The mortar shall be kept constantly agitated until used.

3.03 FREEZING WEATHER

A. The mixing and use of mortar in freezing weather shall be subject to the same requirements as herein specified for mixing and placing concrete under similar conditions.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 05 05 23.02
MISCELLANEOUS METAL FASTENINGS

PART 1 GENERAL

1.01 REQUIREMENTS

A. All welding must be performed in accordance with ANSI/AWS D1.1 and ANSI/AWS D1.4. No welding will be performed when the base metal temperature is lower than thirty-two (32) degrees Fahrenheit.

1.02 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.03 PAYMENT

A. There will be no separate payment for this work, the cost shall be included in prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ANSI/AWS D1.1 Structural Welding Code – Steel

B. ANSI/AWS D1.4 Structural Welding Code – Reinforcing Steel

C. AISC-04 Steel Building Specification

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

1.08 WELDER, WELDING OPERATOR AND TACKER QUALIFICATION

A. Each welder, welding operator and tacker assigned to work on this Contract shall be certified in conformance with ANSI/AWS D1.1, Section 4. Welders shall also be New York City certified, and all welding shall be done in conformity with the NYBC and BS&A.

PART 2 PRODUCTS

2.01 WELDING EQUIPMENT AND MATERIALS

A. All welding equipment, electrodes, welding wire and fluxes must be capable of producing satisfactory welds when used by a qualified welder or welding operator performing qualified welding procedures.

B. All welding equipment and materials must comply with the applicable requirements of ANSI/AWS D1.1 and ANSI/AWS D1.4.

PART 3 EXECUTION

3.01 WELDING REQUIREMENTS

A. Contract Drawings will include the following information:

1. Size, length, type and location of welds.

2. Location of welds for which non-destructive testing is required. When location of non-destructive testing is not shown, it will be indicated by the Engineer in the field.

B. Workmanship and techniques for welded construction must conform to the requirements of ANSI/AWS D1.1 and AISC-04. When ANSI/AWS D1.1 and AISC- 04 are in conflict, the requirements of ANSI/AWS D1.1 shall govern.

C. Welding of reinforcing must conform to the requirements of ANSI/AWS D1.4. Welds must develop a minimum of 85,000 psi tensile strength. Bars to be welded must be cut by means of an oxyacetylene torch or by sawing. Ends must be free of dirt, oxide scale, oil, grease, or other foreign matter. Sheared ends of bars must be trimmed back at least 1/2-inch by sawing or flame cutting. Preheat and interpass temperature must conform with ANSI/AWS D1.4. Bars having a carbon equivalent content in excess of 0.50 percent shall not be welded.

D. Where dissimilar steels are welded together, the procedure used must be the same as the one used for the lower strength steel.

E. All groove welds must be 100 percent complete penetration welds as defined in ANSI/AWS D1.1 or shown in ANSI/AWS D1.4 for reinforcing steel, regardless of whether a backup plate is shown or whether the supplementary backing weld or melt through symbol is included, in each groove-weld symbol shown unless partial penetration is included in the weld symbol.

F. Gun welded studs must conform to the requirements of ANSI/AWS D1.1, Section 7.

G. Upon completion of welding, all weld splatter, flux, slag and burrs left by attachments must be removed. Welds must be repaired to produce a workmanlike appearance with uniform weld contours and dimensions. All sharp corners of material which is to be painted or coated must be ground to a minimum of 1/32-inch on the flat.

3.02 STANDARDS OF ACCEPTANCE

A. Dimensional tolerances for welded construction, details of welds, and quality of welds must be in accordance with the applicable requirements of ANSI/AWS D1.1, ANSI/AWS D1.4 and the Contract Drawings.

B. The welding must be subject to inspection and tests in the shop and project site. Inspection and tests in the shop will not relieve the Contractor of the responsibility to furnish weldments of satisfactory quality.

C. All welding exhibiting any cracks, either in the weld metal or the parent metal, will be rejected.

D. Defective or unsound welds or base metal must be corrected either by removing and replacing the entire welds.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 09 91 00
PAINTING

PART 1 GENERAL

1.01 SUMMARY

A. Painting, as specified herein, shall include, but not be limited to, preparation of surfaces, shop painting of items furnished, and field painting of structures, piping, conduit, ducts and equipment, and marking of piping and electrical conduit.

B. Painting shall be provided as shown on the Contract Drawings, specified herein or in the Contract, or as required for a complete installation.

C. The following index of this Section is presented for convenience:

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D. The following schedule, attached after the End of Section designation, is a part of this Section:

1. Material Paint Schedule

1.02 PAYMENT

A. There will be no separate payment for the Work specified herein. All costs for Work required by this Section shall be included in the applicable lump sum, unit price(s) or allowance(s) set forth in Section 01 27 00 – Measurement and Payment.

1.03 RELATED SECTIONS

A. Section 26 05 33 – Raceways and Boxes for Electrical Systems.

1.04 REFERENCES

A. SSPC - The Society of Protective Coatings (formerly of Steel Structures Painting Council)

1. SSPC-SP 1 Solvent cleaning
2. SSPC-SP 6 Commercial blast cleaning
3. SSPC-SP 10 Near white cleaning
4. SSPC-SP 2 Hand tool cleaning
5. SSPC-SP 11 Power tool cleaning to bare metal
6. SSPC- SP 15 Commercial grade power tool cleaning
7. SSPC-SP 16 Brush off Blast Cleaning of Non Ferrous Metals

B. ASTM - American Society for Testing Materials

1. ASTM D3359 - Measuring Adhesion by Tape Test
2. ASTM D16- Terminology Relating to Paint, Varnish, Lacquer, and related Products

C. NSF- National Sanitation Foundation Standards

1.05 DESCRIPTION

A. Safety Requirements

1. All painting materials specified herein, and ingredients of coatings containing substances that are potentially toxic or hazardous shall be shipped with warning labels. These products shall be applied in strict conformance with the safety requirements of the following:

a. Manufacturer
b. National Paint and Coatings Association (NPCA)
c. Society of the Plastics Industry (SPI)
d. Manufacturing Chemist Association (MCA)
e. Society of Protective Coatings (SSPC)

f. United States Government Occupational Safety and Health Administration (OSHA)

g. Health and Safety Requirements of the State of New York (PESH-Public Employees Safety and Health)

h. Health and Safety Requirements of the City of New York (COSH-Citywide Office of Safety and Health)

B. Environmental Requirements

1. Weather:

a. Air and surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with manufacturer's instructions.

b. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above dew point.

c. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with manufacturer's instructions.

d. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog or mist.

e. Wind: Do not spray coatings if wind velocity is above manufacturer's limit.

2. Ventilation

a. Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with AWWA D102.

3. Dust and Contaminants:

a. Schedule coating Work to avoid excessive dust and airborne contaminants.

4. Protect Work areas from excessive dust and airborne contaminants during coating application and curing.

1.06 QUALITY ASSURANCE

A. Paint Quality Assurance Records

1. The following information shall be recorded for every paint project and submitted to the Project-Manager:

a. Date

b. Shift

c. Part Temperature

d. Dew Point

e. Paint Batch Number/s

f. Mixing Time for Each Part and the Combined Parts of a Paint System

g. Pot Life

h. Curing Time of Primer and Finish Layers

i. Paint thickness measurements (DFT)

j. Holiday Test Results and Repair Data

k. Peel Test Results and Repair Data

l. Foreman or Supervisor's Signature

B. Test Surfaces

1. The Contractor shall paint certain areas of concrete and other surfaces, where directed, using approved coatings for use by the Engineer for comparisons with coating systems applied during the progress of the Work.

2. Such coated areas shall not be subsequently painted during the entire period of construction.

3. Within one year after Substantial Completion, the test surfaces shall be inspected by the City for any deterioration such as cracks, blisters, flakes and excessive chalking.

4. The Contractor shall supply all material and labor and shall perform any remedial Work on all such deteriorated surfaces using the coating system represented by the test surface at no additional cost to the City.

C. Painting Requirements

1. General: The Contract does not specify the surface treatment for every individual part of the Work, however this Contract shall be provided with a complete painting job throughout the Work as specified herein. All items customarily or specified to be shop painted shall be primed and finished in the shop. Field painting will not be allowed unless requested in writing to the Engineer, and written consent is given by the Engineer. In general, only areas that are to be field welded are not to be painted until field erected.

2. Manufacturer's Standard Finished Items: The following items shall be furnished with the manufacturer's standard prime and finish coats applied in the shop: pumps, motors, gears, gear housings, air compressors, wall fans, temperature control and instrument panels, process air blowers, engines, filters, strainers, air dryers, meters, gas boosters, gas turbines, generators, panelboards, transformers, boilers, condensing units, water chillers, cooling towers, condensers, heat exchangers, humidifiers, air handling units, sound attenuators, air conditioning and dehumidification units, convector cabinets, unit heaters, enclosures for finned tube radiators, cabinet heaters, boilers, wood seats, lockers, metal toilet partitions, metal urinal screens, aluminum fascia, motor control centers, aluminum light standards, and hoisting equipment. Steel reinforcing bars for concrete shall be coated in accordance with the Contract. When powder coatings are required by the Contract, the powder coatings shall be in accordance with the requirements of the manufacturer of the item.

3. Painted Items: The following items shall be painted as specified herein: steel water storage tank, structural steel and wrought metals, composite metal floor deck, pipelines, hangers and supports, sluice gates, pumps and pumps parts, valves, valve and sluice gate operators and stands, guard housings, air filter equipment, effluent strainers, heat exchangers, air receivers, tanks, air silencing equipment, storage tanks, gas domes, sediment tanks, steel stair framing, steel lintels, hollow metal doors and frames, gypsum wallboard, interior concrete block, interior concrete walls, columns, beams and ceilings, covering over insulation on piping, electrical conduit systems, small piping and copper tubing, ducts, covering over ducts, and PVC piping, valves and fittings.

4. Unpainted Items: The following items shall not be painted, unless otherwise specified: registers, grilles, dampers and linkage, fire sprinklers, name and identification plates and tags, floor gratings, brass pipe and fittings, brass valves, stainless steel, wood, stop log panels, spray-on fireproofing steel to receive spray-on fireproofing, surfaces to receive field welding, and fraying surfaces of high strength bolted connections.

1.07 SUBMITTALS

A. Contractor shall submit Shop Drawings for approval by the Engineer. Submittals shall include, but not be limited to:

1. Catalog cuts and reference materials.

2. Paint Samples:

a. Two one-quart samples of each required kind of paint material, or the ingredients thereof which are to be mixed on the job.

b. Samples shall be labeled, and shall include the certificate of the manufacturer stating the actual percentages by weight and volume of all ingredients entering into the mixture.

c. Upon request, further samples shall be provided as the Work progresses.

d. Painting materials shall not be applied without written approval of samples by the Engineer.

3. Painted Surface Samples:

a. Upon request, duplicate samples of the results obtained by painting and finishing various materials on the Work shall be submitted. Such samples, and the approved paint applied thereto, shall be applied in strict conformance with these Sections.

b. Finished areas shall be considered adequate for the purpose of determining the quality of the Work. All painting work shall be performed in a quality equal to the approved samples.

c. Where equipment is customarily shipped with a standard finish, samples of the proposed color and finish shall be submitted for approval prior to shipping.

4. Certification:

   a. Affidavits from the manufacturer certifying that materials furnished conform to the requirements specified.

   b. And that paint products have been checked for compatibility.

5. Immersion Certification:

   a. Affidavits from the manufacturer certifying that coatings in immersion service contain no water soluble solvents or corrosion inhibitive (active) pigments with slight water solubility.

6. List of Paints:

   a. A list of paint products with mil thickness and solids by volume, including all paint applied in the shop and in the field. The list shall be in accordance with the requirements of this Section and the recommendations of the paint manufacturer.

7. Applicator's Quality Assurance:

   a. Submit list of a minimum of 5 completed projects of similar size and complexity to this work. Include for each project:

      1) Project name and location

      2) Name of owner

      3) Name of contractor

      4) Name of engineer

      5) Name of coating manufacturer

      6) Approximate area of coatings applied.

      7) Date of completion.

8. Warranty:

   a. Submit manufacturer's standard warranty.

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SECTION 09 91 00
PAINTING

1.08 DELIVERY, STORAGE, AND HANDLING

A. General: All products and materials shall be delivered, stored, and handled as specified in Contract Documents and as follows:

B. Delivery and Storage: All paint materials delivered and stored at the site shall be from the approved manufacturer only.

C. Packaging and Labeling: Paints, stains, varnish or ingredients of paints to be used on the job shall be properly prepared, packed, and labeled. All materials shall be delivered to the Site in original, unbroken containers bearing the manufacturer's printed labels, which shall specify the following:

1. Project and Contract No.
2. Name of manufacturer
3. Address of manufacturer
4. Generic name of paint or ingredients
5. Brand and trademark
6. Schedule letter as listed herein
7. Percent solids by volume
8. Net quantity
9. Date of manufacturer
10. Date packed

D. Storage: Painting materials shall be stored at the Site in manner and place which shall be in accordance with applicable codes and regulations, and in accordance with manufacturer's instructions. The storage space shall be kept clean at all times. Every precaution shall be exercised to eliminate fire hazards.

1.09 SPARE PARTS, SPECIAL TOOLS, AND SUPPLIES

A. Not Used

1.10 WARRANTY

A. Not Used

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PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Standards of Quality: Proprietary protective coatings included herein by brand name or trade mark are given solely as standards of quality and for bidding purposes and do not preclude the use of an approved equivalent.

B. Latest Products: Unless specified otherwise, the proprietary protective coatings of the manufacturer's latest products in regular production on the date of receipt of order shall be provided.

C. Equivalents: Equivalent products shall be of a standard, regularly produced product of a manufacturer. Equivalent products shall be submitted on their applicable published printed literature that states the generic type, instructions for use, solids by volume, application rates, and chemical components of vehicles and solids. Equivalent products shall be accompanied by a list of projects where each of the coatings has been used on new construction and has rendered satisfactory service for at least three years. Should the manufacturer's literature of the product being offered call for higher film thickness, the greater film thickness shall be applied, and the submitted schedule shall so state.

D. Paints shall be as manufactured by the following manufacturers:

1. Tnemec Company, Inc., Kansas City, MO.
2. Sherwin Williams, Cleveland, OH.
3. International Paint, Houston, TX.
4. Carboline Company, St. Louis, MO.
5. PPG Amercoat, Little Rock, AR.
6. Or approved equal.

2.02 MATERIALS / EQUIPMENT

A. General:

1. Compatible shop and field coats shall be provided.
2. All coats of paint for any particular surface shall be from the same manufacturer.
3. Paint shall be of approved color as selected from the manufacturer's standard range of colors.
4. The Contractor shall submit proposed modifications to the specified painting systems for the Engineer's approval prior to use.
5. Paints containing lead or manganese driers shall not be submitted.

B. Classification of Paints: Alphabetical designations have been used in the following list to classify/group acceptable paints by the type and quality of materials desired. Equivalent material from the manufacturers named above or from other approved manufacturers may be used in any of these paint groups in accordance with the procedures for substitution. Refer to the "Material Painting Schedule", attached after the "End of Section" designation, for applicability of these paint groups.

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PAINTING

CLASSIFICATION OF PAINTS			
Paint Group	**Product Name and Number**	**Volume Solids %**	**Dry Film Thickness Mils per Coat**
A	**Tnemec:** Series V69 Hi-Build Epoxoline II	69	3.0-5.0
	Carboline: Carboguard 60/61 or Carboguard 635 or Carboguard 890 Series	72 65 75	4.0-8.0 4.0-6.0 4.0-8.0
	Sherwin Williams: Macropoxy 240	72	2.0-4.0
	International Paint: Integrated 345 or Devran 224V	70/77	3.0-4.0 (typically 4.0-6.0)
	PPG: Amerlock 2/400	85	4.0-8.0
B	**Tnemec:** Series V140-44 BR Pota-Pox Plus	69	4.0-6.0
	Carboline: Sanitile 120	38	1.0-2.0
	Sherwin Williams: Dura-Plate 235 (Waste Water)	68	3.0-5.0
	International Paint: Interseal 670 HS or Bar Rust 233HS	82/80	3.0-6.0 (typically 4.0-8.0)
	PPG: Amerlock 2/400	85	4.0-8.0
C	**Tnemec:** Series 1095 Endura-Shield	68	2.0-3.0
	Carboline: Carbothane 134 Series or Carbothane 134WB	70 50	2.0-3.0 2.0-3.0
	Sherwin Williams: Hi Solids Polyurethane 250 or Sherloxane 800	63 90	3.0-5.0 4.0-6.0
	International Paint: Interthane 990V or Devthane 379	71/63	2.0-3.0
	PPG: Pithane Ultra	70	2.0-3.0
D	**Tnemec:** Series V69 Hi-Build Epoxoline II	69	3.0-5.0
	Carboline: Carboguard 61 or Carboguard 691 or Carboguard 635 Series	72 80 65	4.0-8.0 4.0-20.0 4.0-8.0
	Sherwin Williams: Macropoxy 646	72	4.0-6.0
	International Paint: Interseal 670HS or Bar Rust 233H/236	82	3.0-6.0
	PPG: Amerlock 2/400	85	4.0-8.0
E	**Tnemec:** Series 90-97 Tnemec-Zinc	63	2.5-3.5
	Carboline: Carbozinc 859 Series or Carboguard 890 Series or Carboguard 60/61	66 75 72	3.0-10.0 4.0-10.0 4.0-10.0
	Sherwin Williams: Corothane I Galvapac	67	2.5-3.5

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CLASSIFICATION OF PAINTS			
Paint Group	**Product Name and Number**	**Volume Solids %**	**Dry Film Thickness Mils per Coat**
	International Paint: Interzinc 52	59	3.0-5.0 (typically 2.0-3.0)
	PPG: Amercoat 68HS	70	2.5-5.0
F	**Tnemec:** Series 54 Envirofill Masonry Filler	68	As Required
	Carboline: Sanitile 100 Block Filler or Carbocrylic 3350	54	As Required
	Sherwin Williams: Heavy Duty Block Filler (dry) Kem Cati –Coat Epoxy Filler/ Sealer	50 72	8-10 10-20
	International Paint: Devran 224 or Intercrete 4820	77/NA	As Required
	PPG: Perma-Crete 4-100XI	55	8.0-11.0
G	**Tnemec:** Series 151 Elasto-Grip	17	1.0-1.5
	Carboline: Galoseal WB	31	0.5-1.0
	Sherwin Williams: Pro-Mar 200 Zero VOC / Primer	26	1.0-2.0
	International Paint: Intercryl 520	44	1.0-2.0 (typically 2.0-3.0)
	PPG: Seal Grip 17-921XI	28	1.6
H	**Tnemec:** Series 1026	43	2.0-3.0
	Carboline: Sanitile 155	38	2.0-3.0
	Sherwin Williams: Pro-Mar 200 Zero VOC Series Eg-Shel (dry wall) or Pro Industrial DTM Acrylic Gloss (pipe insulation)	42 40	1.5-2.0 2-4
	International Paint: Intercryl 530/WB	35	1.5-2.0 (typically 2.0-3.0)
	PPG: Speedhide Interior Latex 4510XI	37	1.5

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CLASSIFICATION OF PAINTS			
Paint Group	**Product Name and Number**	**Volume Solids %**	**Dry Film Thickness Mils per Coat**
I	**Tnemec:** Series V140-AA83 Pota-Pox Plus	82	4.0-6.0
	Carboline: Carboguard 691/ Phenoline Tank Shield	80-100	4.0-20.0
	Sherwin Williams: Macropoxy 646 PW	72	4.0-6.0 (2-4 as concrete primer)
	International Paint: Interseal 670HS or Bar Rust 233H	82/80	4.0-6.0 (typically 4.0-8.0)
	PPG: Amerlock 2	85	4.0-8.0
J	**Tnemec:** Series 141 or Series 435	82 100	1.0-3.0 20-30
	Carboline: Carbozinc 621 / Plastite 4503 / Carboguard 691	80-100	4.0-10.0
	Sherwin Williams: Duraplate 235	68	3.0-5.0
	PPG: Amerlock 2	85	4.0-8.0
K	**Tnemec:** Series 141 or Series 435	82 100	1.0-3.0 20-30
	Carboline: Reactamine 760 Series Plasite 4550S	100 100	20.0-100.0 20.0-60.0
	Sherwin Williams: PolyCote 115 or Duraplate 6000	100 100	25.0-100.0/ 40.0-125.0
	International Paint: Enviroline 222	100	20.0-100.0 (typically 70.0-80.0)
	PPG: Amerthane 490	100	20.0-100.0
L	**Tnemec:** Series 141	82	6.0-14.0
	Carboline: Reactamine 28 or Carboguard 1340 WB	100 55	1.0-2.0 1.5-2.0
	International Paint: Interzone 954	85	14.0-18.0 (typically 18.0-20.0)
	PPG: Amerlock 2	85	4.0-8.0
M	**Tnemec:** Series 431 Perma- Shield PL	100	30.0-40.0
	Carboline: Reactamine ET	100	30.0-40.0
	Sherwin Williams: Duraplate UHS or Duraplate 6000	100 100	30.0-40.0 40-60
	PPG: Novaguard 890	100	25.0-30.0

CLASSIFICATION OF PAINTS			
Paint Group	**Product Name and Number**	**Volume Solids %**	**Dry Film Thickness Mils per Coat**
N	**Tnemec:** Series FC22 or 22 Epoxoline	100	20.0-30.0
	Carboline: Phenoline Tank Shield / Polyclad 777 Series	100	20.0-30.0
	Sherwin Williams: Sher Plate PW or Duraplate UHS	100 100	25.0-35.0 25-35
	International Paint: Interline 975P	100	30.0-40.0 (up to 50.0 mils max)
	PPG: Novaguard 810 ER	100	20.0-40.0

2.03 FABRICATION / ASSEMBLING / FINISHES

A. Not Used

2.04 SOURCE QUALITY CONTROL / SHOP TESTS

A. Not Used

PART 3 EXECUTION

3.01 EXAMINATION / PREPARATION

A. Surface Preparation: Prior to painting, Surface preparation prior to painting shall be in accordance with the following guidelines and as recommended by the painting material manufacturer.

SURFACE PREPARATION GUIDELINES	
Class of Work	Preparation of Surface Prior to Painting
Structural Steel and Steel Encased in Concrete, Masonry or Fireproofing	All visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter shall be removed by compressed air nozzle blasting, centrifugal wheels or other specified method. Discoloration caused by certain stains shall be limited to no more than 33 percent of each square inch of surface area in accordance with Society of Protective Coatings (SSPC-SP6).

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SURFACE PREPARATION GUIDELINES	
Class of Work	Preparation of Surface Prior to Painting
Steel (other than structural, encased or galvanized) and Steel Submerged Under Water	All visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter shall be removed by compressed air nozzle blasting, centrifugal wheels or other specified method. Discoloration caused by certain stains shall be limited to no more than 5 percent of each square inch of surface area in accordance with Society of Protective Coatings (SSPC-SP10).
Galvanized Steel and Other Metals	All welds, beads, blisters or protuberances, other than identification markings shall be smooth, and other imperfections shall be removed. All nonferrous metals and galvanized steel, whether shop primed or field primed, shall be solvent cleaned in accordance with Society of Protective Coatings (SSPC-SP1).
Canvas Pipe Covering	All adhering debris shall be removed and indentations or other unsightly spots shall be smoothed out to give a uniform, even surface. Surfaces shall be brushed clean.
Gypsum Wallboard and Plastered Surfaces	Gypsum wallboard shall be prepared as recommended by the wallboard manufacturer. Plaster surfaces shall be dry. Scratches, cracks, holes and other defects shall be filled flush with adjoining surfaces by approved methods, sandpapered smooth, and brushed clean.
Concrete and Masonry Surfaces	Concrete and masonry shall be dried for a minimum of 28 days and then the dry concrete and masonry shall be brushed and washed to remove all loose dirt, dust, free lime and other deleterious substances by approved methods. Protruding fins and other adhering matter shall be removed or ground until a smooth, even finish is obtained. Concrete surfaces to be painted shall be acid etched or otherwise roughened as recommended by the manufacturer of the coating to be applied, to produce a slightly granular surface required for adherence of coating to the concrete, unless otherwise indicated.
PVC	All adhering debris shall be removed and surface shall be roughened using suitable sandpaper. Surfaces shall be dry and free from dirt, oil, grease etc.

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PAINTING

3.02 APPLICATION

A. General: All painting and coatings shall be applied in accordance with the manufacturer's recommendations and approved submittals. A representative of the paint manufacturer shall inspect the surfaces to be painted and shall advise on the proper application. The paint manufacturer representative shall periodically be consulted regarding ambient temperature and humidity conditions.

B. Shop Painting: The following items shall be provided with shop coats of primer and finish coats as herein specified before exposure to the weather:

1. Metals:

a. Structural steel

Note: Consider using hot dip galvanizing at crevices or hard to reach places on structural steel.

b. Miscellaneous steel and wrought iron

c. Ornamental wrought and light iron

d. Iron castings

2. Machinery and Equipment:

a. Mechanical and electrical equipment

3. Pipe:

a. All piping except galvanized iron, stainless steel, aluminum, copper, brass and bronze piping.

C. Field Painting: All painting at the site of the project is hereby designated as field painting for those items that cannot be shop painted or are touched up due to minor damage to the painted surface.

1. Repair and Repainting: Field coatings shall not be applied until all marred surfaces have been repaired or repainted. Shop coated surfaces shall be thoroughly cleaned and retouched prior to the application of successive paint coats in the field.

2. Unpainted Materials: Do not paint or finish copper, bronze, chromium plate, nickel, stainless steel, aluminum (except ducts and conduit adjacent to finish painted surfaces), monel metal, lead, lead coated copper and brass, except as otherwise indicated.

3. Items to Receive Coating: All ferrous metals and insulated surfaces shall be provided with a protective coating. Interior surfaces, exposed masonry walls and concrete walls, floors and ceilings shall be provided with protective coatings as specified.

4. Surface Condition: Only surfaces that are dry and free from dust, grease or other undesirable or interfering substances shall receive coatings. Coatings shall be as specified in the “Material Painting Schedule” , attached after the “End of Section” designation.

5. Application: Finish coats shall be applied after all adjacent work has been completed. Successive coats shall have different shades or tints of color wherever possible. Colors shall be as selected and approved by the Engineer. Prime and successive finish coats shall be cleaned, sand papered, or otherwise treated before the next coat is applied, in accordance with the recommendations of the coating manufacturer, and as approved by the Engineer. All coats shall be inspected and approved by the Engineer, before application of any succeeding coats. All coats shall be applied to the dry film thickness (DFT) specified. Coatings shall be applied by skilled personnel under adequate illumination. All painted surfaces shall be left in a clean, orderly and acceptable condition.

6. Surface and Atmospheric Conditions: Paints shall not be applied when the surface temperature is less than 40 degrees F, when the relative humidity exceeds 85 percent, or when the surface to be painted is wet or damp, unless more stringent requirements are called for by the paint manufacturer.

D. Field Painting Operations: Surfaces to be given protective coating shall be thoroughly cleaned. Scratches and abrasions on equipment which has been shop coated shall be refinished and all surfaces to be field painted shall be approved by the Engineer before proceeding with painting. Painting shall be performed in a continuous and orderly operation to facilitate adequate inspection, however material subject to weathering or corrosion shall be given prime coats as quickly as practicable.

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1. Method of Application: All paint material shall be applied by brush or roller. Spray painting will be permitted only with the specific approval of the Engineer. Surfaces which are so close together as to prevent the insertion of a standard size roller or brush shall be painted thoroughly with the prescribed number of coats by using special narrow rollers or brushes.

2. Adjacent Areas: Areas under and adjacent to painted surfaces shall be fully protected at all times. Dripped or spattered paint shall be promptly removed and any adjacent surfaces that have been damaged or discolored by overspray shall be repaired, refinished, and repainted.

3. Tinting: Successive coats of paint shall be tinted to make the various coats easily distinguishable. Undercoats of paint shall be tinted to the approximate shade of the final coat of paint. Final coats of paint shall not be applied until all other work has been completed, the dirt and rubbish removed and the surfaces suitably prepared. Paint to be applied shall be at room temperature.

4. Conditions for Application: Each coat of paint shall be given sufficient time to cure per the manufacturer's recommendation before application of the succeeding coat. Each succeeding coat shall be applied within the recoat time specified by the manufacturer; otherwise the painted surface shall be prepared per the manufacturer's recommendation before it is recoated. Exterior painting will not be allowed in dust laden air, during damp or threatening weather, or on moist or wet surfaces, or when the surface temperature is below 40 degrees F on a falling thermometer or under 50 degrees for catalyzed epoxy material; it will not be allowed in extreme heat or when metal is hot enough to cause the paint to blister and produce a porous film. Do not apply interior painting until the building is thoroughly dry. If the temperature in the interior of the building, in the opinion of the Engineer, is too low painting will be stopped until the building is heated. Proper ventilation and sufficient heat shall be maintained to permit the paint to dry. The building shall be maintained to be free from dust.

5. Remedial Work: Any paint found defective shall be removed. Touch-up and remedial painting shall be provided as directed and as required until completion and acceptance of final work. If damage to the painted surface is excessive, as determined by the Engineer, that item shall be rejected and shipped back, at Contractor's expense, to be properly recoated before it can be accepted.

6. Application: Each coat of paint shall be applied as a continuous film of uniform thickness, free of pinholes and blemishes, to the maximum extent practicable. Any thin spots or areas missed in the application shall be repainted and permitted to dry before the next coat is applied. An approved low voltage wet sponge "holiday" detector shall be used as directed by the Engineer. All paint shall be carefully applied to a smooth even coating without runs or sagging. Enamels shall be brushed with a smooth even flow. Each coat of paint shall be dry, not only on the surface, but throughout the

thickness of the paint film, before the next coat is applied. Finished surfaces shall be uniform in gloss, finish, and color, and free from flash spots and brush marks. In all cases, the resultant paint film produced shall be satisfactory in all respects to the Engineer.

7. Thinning: If the paint material must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material (i.e., one gallon of paint as originally furnished must not cover a greater surface area when sprayed than when applied unthinned by brush). Where thinning is necessary, only the products of the manufacturer furnishing the paint shall be used for the particular purpose, and thinning shall be done with the manufacturer's knowledge, in accordance with his printed instructions.

8. Thickness and Adhesion Testing: Dry film thickness of each coat shall be as specified herein. Dry film thickness will be checked by the Engineer or a representative with a magnetic gauge for ferrous metal in accordance with SSPC 2 or Tooke gauge destructive test for concrete. Film thickness of shop coats or other previously applied coating shall be checked by the Engineer or a representative and recorded before painting in order to determine thickness of field coats. Dry film thicknesses for concrete surfaces shall be determined by measuring with a wet-film gauge and by material consumption. Paint adhesion shall be tested by the peel method in accordance with ASTM D 3359.

9. Inaccessible Items: Exposed members which will be inaccessible after erection shall be painted and cleaned prior to erection.

10. Coverage: All surfaces to be painted shall be completely covered. When color on undercoats shows through the final coat of paint, surfaces shall be covered by additional coats until paint is of uniform color and appearance and coverage is complete.

11. Safe Atmosphere: The Contractor shall provide sufficient temporary ventilation during painting operations in enclosed areas to remove moisture and solvents, and to keep the atmosphere safe from harmful or dangerous fumes and dust levels for personnel.

E. Workmanship: Only skilled painters shall perform the work and specialists shall be employed where required. Finished surface shall not show brush marks or other irregularities. Top and bottom edges of doors shall be painted as required for the adjacent surfaces. Undercoats on hollow metal shall be thoroughly and uniformly sanded with No. 00 sandpaper, or equal abrasive, to remove all surface defects and provide a smooth, even surface.

F. Mixing: All paints and coatings shall be mixed in accordance with the manufacturer's instructions on the printed label. The Contractor shall provide galvanized iron pans of sufficient size to contain all mixing pails and mix all paints and ingredients therein.

G. Rates of Application: Paints shall be applied so as to give coverage per gallon not greater than that recommended by the manufacturer. Quantities of paint used for successive coats on the various parts of the work shall be recorded in a manner satisfactory to the Engineer.

H. Touch-Up of Shop-Primed and Finished Items: Touch-up of any and all damaged portions and imperfections in shop-primed and finished items shall be accomplished using the same paint as used for the shop prime and finish. Surface shall be prepared prior to touch-up by wire brushing and sanding to remove rust, scale and loose paint.

I. Aluminum and Incompatible Surfaces: Where aluminum surfaces come in contact with incompatible metals, lime, mortar, concrete or other masonry materials, one field coat of Group A paint as specified under Article 2.02.B. "Classification of Paints" in this Section shall be applied to the incompatible surfaces.

J. Concealed Surfaces: All wall surfaces which will be concealed by equipment shall be painted before equipment installation.

3.03 FIELD TESTING / QUALITY CONTROL

A. Not Used

3.04 STARTUP / DEMONSTRATION

A. Not Used

3.05 ADJUSTING / PROTECTION / CLEANUP

A. The Contractor shall touch up and restore any finish damaged. Paint or other finishes spilled, splashed or splattered shall be removed from all surfaces using care so as not to mar any surface or item being cleaned.

1. The Contractor shall rectify any failures or breakdowns, loosening of the paint or coatings within a year after acceptance of work, regardless of the paint systems used. This will require removal of the entire coating where failure occurs and repainting with the coating system previously specified. Patching will not be allowed.

END OF SECTION

MATERIAL PAINTING SCHEDULE																				
Materials and Conditions	**Paint Groups (refer to "Classification of Paints" table for acceptable paints in Groups A-N)** **Tn: Tnemec, Cb: Carboline, SW: Sherwin Williams, IP: International paint, PPG: PPG/Amercoat**																			
	Prime Coat					**Finish Coats**														
						1st					**2nd**					**3rd**				
Paint Manufacturer	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**
Steel and Iron - Structural and Miscellaneous Uses:																				
Interior (Indoors) shop primed, field finished	B or E or I	A	A or D	A	A	B or I	A	D	A	B	B or I	A	D	A	B	--	A	D	A	B
Exterior (Outdoors) shop primed, field finished	B or I	A	A or D	A or B or E	A	C	A	D	A or B	B	--	A	D	A	B	--	C	C	C	C
Submerged, Buried or Continuously Wet Exposed to sewage, shop primed, field finished	B or I	A	A	B	B	J or K or L or M	A	B or J	B	B	--	D	B or J	D	B	--	D	B or J	D	--
Steel and Iron - Industrial Equipment (Exposed to wastewater):																				
Submerged, Buried or **continuously wet in wastewater**, completely shop coated inside and out, includes OEM factory finished items such as gates, valves, etc.	J or K or L or M	A Or K*	A or M*	D or K or L	A	J or K or L or M	A	B or J	D	B	--	A	B or J	D	B	--	--	B or J	D	B

MATERIAL PAINTING SCHEDULE																				
Materials and Conditions	**Paint Groups (refer to "Classification of Paints" table for acceptable paints in Groups A-N) Tn: Tnemec, Cb: Carboline, SW: Sherwin Williams, IP: International paint, PPG: PPG/Amercoat**																			
	Prime Coat					**Finish Coats**														
						1st					**2nd**					**3rd**				
Paint Manufacturer	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**
Above grade, indoors, **exposed to waste water**, completely shop coated inside and out, includes OEM factory finished, items such as gates, valves etc.	J or K or L or M	A or N*	A or M*	D or K or L	A	J or K or L or M	A	B or J	A or D	B	--	A	B or J	A or D	B	--	--	B or J	A or D	--
Above grade, outdoors, **exposed to waste water**, completely shop coated inside and out, includes OEM factory finished, items such as gates, valves etc.	J or L or M	A or N*	A or M*	D or E or K or L	A	J or L or M	A	B or L	A or D	B	--	A or C	B or J	A or D	B	--	--	C	A or D	--
Inside of item immersed in sewage	J or K or L or M	A or N*	A or M*	D or K or L	B	J or K or L or M	A	B or J	D	B	--	A	B or J	D	B	--	--	B or J	D	B
Ductile Iron or Steel Process Piping, submerged, Buried or constantly wet, **exposed to sewage**, H2S exposures, OEM factory finished.	M*	A or K*	A Or M*	D or K	M	--	A	B	D or K	--	--	A	B or J	D or K	--	--	--	B or J	D or K	--
Steel and Iron - Industrial Equipment (Exposed to Potable water):																				

MATERIAL PAINTING SCHEDULE																				
Materials and Conditions	**Paint Groups (refer to "Classification of Paints" table for acceptable paints in Groups A-N)** **Tn: Tnemec, Cb: Carboline, SW: Sherwin Williams, IP: International paint, PPG: PPG/Amercoat**																			
	Prime Coat					**Finish Coats**														
						1st					**2nd**					**3rd**				
Paint Manufacturer	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**
Shop primed, field finished	B or I	A or J	E or I	B or I	A	B or I	D	I	B or I	B	B or I	D	I	B or I	B	--	--	--	B or I	--
Exposed to Potable water (NSF) completely shop coated, inside and out, OEM factory finished items such as Gates, Valves etc.	B or I	A or J	E or I	B or I or N	A	B or I	D	I	B or I	B	B or I	D	I	B or I	B	--	--	--	--	--
Equipment above grade, indoors, **exposed to Potable water** (NSF), completely shop coated inside and out, OEM factory finished items such as Gates, Valves etc.	B or I	A or J	E or I	B or I or N	A	B or I	D	I	B or I	B	B or I	D	I	B or I	B	--	--	--	--	--
Equipment above grade, outdoors, **exposed to Potable water** (NSF), completely shop coated inside and out, OEM factory finished items such as Gates, Valves etc.	N*	A or J	E or I or N*	B or I or N	N*	--	D	I	B or I	--	--	D	I	B or I	--	--	--	--	--	--
Ductile Iron or steel process piping **exposed to Potable Water** (shop finished) alternate	N*	A or L or N*	E or I or N*	B or I or N	N*	--	A	I	B or I	--	--	C	I	B or I	--	--	--	--	--	--
MISCELLANEOUS USES:																				
Piping concealed in Masonry	B or I	A	A	A	A	A	A	D	A	B	A	--	D	A	B	--	--	--	--	--

MATERIAL PAINTING SCHEDULE																				
Materials and Conditions	**Paint Groups (refer to "Classification of Paints" table for acceptable paints in Groups A-N)** **Tn: Tnemec, Cb: Carboline, SW: Sherwin Williams, IP: International paint, PPG: PPG/Amercoat**																			
	Prime Coat					**Finish Coats**														
						1st					**2nd**					**3rd**				
Paint Manufacturer	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**
Piping wrapped in Insulation	A	A	A or D	A or B	A	A	A	D	A or B	B	A	--	D	A or B	B	--	--	--	--	--
Heated Metal (Air Main Piping): Submerged, Buried and Exposed	J or L or M*	D or E or M*	D or M*	D	D	--	E	D	D	D	--	A or D	D	D	--	--	A or D	D	D	--
Concrete Masonry: Interior	F	--	F	--	F	A or D	F	D	F	B	D	A	D	D	B	D	A	D	D	--
Concrete: Interior excluding floors	A	B	--	--	A	A or D	A	D	D	B	D	A	D	D	B	--	--	--	D	--
Concrete: Immersion, Waste Water	A or J or L	J or L	--	--	N	A or J or L	D or I or K*	I	D	N	--	D	B or J or K	D	--	--	--	--	D or K	--
Pipe and Duct Insulation: Exposed	A	--	--	--	A	H	B	H	H	B	H	H	H	H	B	--	--	--	--	--
PVC (Interior)	A	--	--	--	A	A	B	D	A	B	A	A	D	A	--	--	--	--	--	--
PVC (Exterior)	A	--	--	--	A	A	B	D	A	C	A	C	C	A	--	C	--	C	C	--
Gypsum Wallboard and Plaster:	G	B	G	G	G	H	H	H	H	H	H	H	H	H	--	H				--

MATERIAL PAINTING SCHEDULE																				
Materials and Conditions	**Paint Groups (refer to "Classification of Paints" table for acceptable paints in Groups A-N)** **Tn: Tnemec, Cb: Carboline, SW: Sherwin Williams, IP: International paint, PPG: PPG/Amercoat**																			
	Prime Coat					**Finish Coats**														
						1st					**2nd**					**3rd**				
Paint Manufacturer	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**	**Tn**	**Cb**	**SW**	**IP**	**PPG**
Nonferrous Metal and Galvanized steel: Interior	A	--	--	--	A	A	G	D	A	B	A	A	D	A	--	A	--	D	A	--
Nonferrous Metal and Galvanized Steel: Exterior	A	--	--	--	A	A	G	D	A	C	A	C	C	A	--	C	--	C	C	--
* Requires only one coat.																				

CONTRACT GI-CONS-7
SECTION 11 14 43
PEDESTRIAN DETECTION EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS

1.02 Under this Section, the Contractor shall install embedded preformed detectable warning units and/or surface applied detectable warning units in accordance with the plans, specifications, and directions of the Engineer.

1.03 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.04 PAYMENT

A. The price bid shall be a unit price per SQUARE FOOT of EMBEDDED PREFORMED DETECTABLE WARNING UNITS installed, and shall include furnishing all labor, materials, and equipment, including, but not limited to bedding material, samples, repairs, and clean-up, and all incidentals necessary to complete the Work in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid shall be a unit price per SQUARE FOOT of SURFACE APPLIED DETECTABLE WARNING UNITS installed, and shall include furnishing all labor, materials, and equipment, including, but not limited to bedding material, samples, repairs, and clean-up, and all incidentals necessary to complete the Work in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.05 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Department of Transportation (NYCDOT) Standard Highway Specifications.

B. New York City Department of Transportation’s (NYCDOT) Standard Details of Construction.

1.06 REGULATORY COMPLIANCE (NOT USED)

1.07 SUBMITTALS

A. The Contractor shall provide documentation showing that the product is on the list of the New York State Department of Transportation’s Approved List of Detectable Warning Units.

1.08 QUALITY CONTROL (NOT USED)

CONTRACT GI-CONS-7
SECTION 11 14 43
PEDESTRIAN DETECTION EQUIPMENT

PART 2 PRODUCTS

A. The detectable warning surface material shall be composed of cementitious material, steel, iron, clay, shale, plastics, polymeric materials, resins, pigments, or as approved by Engineer.

B. Product shall contrast visually with adjoining surfaces by at least 70% as defined in the American with Disabilities Act Accessibility Guidelines Specifications.

C. Product to be uniform in color and texture, be free of cracks or other defects, and have clean-cut and well-defined edges.

D. Where applicable, the units shall adhere to hot mix asphalt or Portland cement concrete surfaces at a minimum air temperature of 60F, and a minimum substrate temperature of 70F.

E. Product to be weather resistant and durable to normal pedestrian wear and maintenance activities.

F. Shall have friction characteristics similar to broomed Portland cement concrete sidewalk surface as determined by the Engineer.

G. For Surface Applied Detectable Warning Unit, Manufacturer shall certify type of material used for warning unit will bond to a prepared surface. The color shall conform to the latest directive of NYCDOT Standard Specification per the Borough having jurisdiction.

H. Embedded Preformed Detectable Warning Unit Physical Properties:

Property	Requirement
Compressive Strength, Min, 28 Days	8 ksi Minimum
Freeze-Thaw Loss (25 Cycles, one per day, 10% NaCl Solution)	1% Maximum

I. Surface Applied Detectable Warning Unit Physical Properties:

Standard	Property	Requirement
ASTM C501	Wear Resistance	Wear Index ≥15
ASTM C1028	Slip Resistance	Dry Friction 0.8 Min.
ASTM E96	Water Vapor Transm.	0.33 oz/sq ft/24 hours

PART 3 EXECUTION

3.01 INSTALLATION OF EMBEDDED PREFORMED DETECTABLE WARNING UNITS

A. Preformed, embedded detectable warning units may be installed in plastic concrete, installed directly on existing subbase prior to placing concrete, inlaid on prepared concrete surfaces, or as otherwise recommended by the manufacturer or specified in the Contract Documents, such that the total combined thickness of concrete base and embedded detectable warning units in the pedestrian ramp area is seven inches.

B. The Contractor shall be required to follow all applicable manufacturer's requirements for environmental conditions, surface preparations, installation procedures, curing procedures, and material compatibility.

C. Immediately prior to setting each waning unit in place, the installer shall mortar the bottom of each unit to ensure that full contact is made with the setting bed after each unit is set firmly and evenly bedded to the required grade and pitch, and brought to an even surface across joints. After the first unit is set in place and periodically thereafter as directed by the Engineer, to verify the Contractor's method of work, warning units shall be lifted immediately after setting in place to verify that full contact is being made with the setting bed. Any gap shall be filled with additional wet bedding mixture, as may be required, and the work method adjusted, as approved by the Engineer, to prevent the occurrence of voids.

D. Warning units (excluding their raised truncated domes) shall be set flush with a top surface elevation tolerance of 1/16" between adjacent units but no more than 1/32" at perimeters between pavers and adjacent curb or sidewalk surfaces.

3.02 INSTALLATION OF SURFACE APPLIED DETECTABLE WARNING UNITS

A. Surface applied detectable warning units may be applied to existing curb ramps, formed and bonded to existing granite slabs, hot mix asphalt, or Portland cement concrete surfaces, or as otherwise directed by the manufacturer or specified in the Contract Documents.

B. The Contractor shall follow all applicable manufacturer's requirements for environmental conditions, surface preparation, installation procedures, curing procedures, and materials compatibility.

C. Prior to the start of Work, the Contractor shall show evidence of successful completion of similar installations and provide a job site sample for the approval of the Engineer. The sample size shall be five feet by two feet minimum and applied at a location selected by the Engineer. All subsequent Work shall conform to the appearance of the approved sample. The sample shall not be incorporated into the work and shall be removed when ordered by the Engineer.

D. The Contractor shall follow all applicable suppliers and manufacturer's requirements for environmental conditions, surface preparation, installation procedures, curing procedures, and materials compatibility.

E. At a minimum, surfaces shall be cleaned by the use of mechanical sweepers, power brooming, or hand brooming. Curing compounds or heavier contamination shall be cleaned by abrasive blasting or other means as approved by the Engineer.

F. Differences in elevation between adjacent surfaces of sidewalk, curb, and the detectable warning surface shall not be more than 3/32" at the perimeters.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 11 68 23.13
EXTERIOR BASKETBALL EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall furnish and erect a complete BASKETBALL BACKSTOP with perforated steel or clear polycarbonate (PC) backboard, in accordance with the plans, NYC Parks standard details, specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 03 30 00 – Cast-in-Place Concrete

C. Section 03 21 00 – Reinforcing Steel

1.03 PAYMENT

A. The price bid shall be a unit price for EACH BASKETBALL BACKSTOP – SINGLE POST (STEEL/POLYCARBONATE BACKBOARD) furnished and installed, and shall include the cost of all labor, materials, and equipment, including posts, concrete for footings, posts filled with concrete, steel reinforcement, unclassified excavation, sawcutting, core drilling (where required), outrigger, tie rods, steel or polycarbonate backboard, goal, goal net, powder coating, locking adhesive and any other incidental expenses necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer. The backstop shall be freestanding only.

B. The price bid shall be a unit price for EACH BASKETBALL BACKSTOP – DOUBLE POST (STEEL/POLYCARBONATE BACKBOARD) furnished and installed, and shall include the cost of all labor, materials, and equipment, including posts, concrete for footings, posts filled with concrete, steel reinforcement, unclassified excavation, sawcutting, core drilling (where required), outrigger, tie rods, steel or polycarbonate backboard, goal, goal net, powder coating, locking adhesive and any other incidental expenses necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer. The backstop can be either freestanding or in line with a new or existing chain link fence as indicated in Contract Documents.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM D3359, Standard Test Methods for Measuring Adhesion by Tape Test

1.05 REGULATORY COMPLIANCE (NOT USED)

CONTRACT GI-CONS-7
SECTION 11 68 23.13
EXTERIOR BASKETBALL EQUIPMENT

1.06 SUBMITTALS

A. All submittal shall be as per Section 01 33 00 – Submittal Procedures.

B. The Contractor shall submit Shop Drawings showing complete details of construction and installation.

C. Warranty for Goal: Upon Final Inspection manufacturer's ten (10) year unconditional warranty shall be submitted, and in turn handed over to M. & O. Borough Capital Liaison by NYC Parks personnel.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS AND MATERIALS

2.01 BASKETBALL BACKSTOP – SINGLE POST

A. POST

1. Post shall be galvanized steel, powder coated per this specification. All fittings for the backboard shall be as indicated on the standard details and shall be powder coated. Post and fittings shall be as manufactured by All City Play Equipment, Brooklyn, NY, or approved equal.

2. The cantilevered basketball backstop shall be attached to one (1) six-inch (6") square, three-sixteenth inch (3/16") thick powder coated square galvanized steel tube.

3. Posts shall be reinforced with two (2) three-eighths (3/8") inch reinforcing bars and filled with average concrete as indicated on the plans and standard details.

B. POST CAP

1. Post shall be galvanized steel, powder coated per this specification. All fittings for the backboard shall be as indicated on the standard details and shall be powder coated. The post caps shall be cast of class 65-45-12 ductile iron, powder coated and secured as shown on the plans.

C. FASTENINGS

1. All fastenings shall be as indicated on the plans and the Contractor shall furnish and install all required bolts, drive and machine screws, pins, rivets, welds, and other fastenings necessary to complete the work, whether specifically indicated on the plans or not. Bolts and nuts shall be galvanized after threading. The drive screws shall be of stainless steel. All fastenings shall be neatly sprayed with powder coat touch-up spray after installation. All fastenings shall be coated with high locking adhesive immediately prior to tightening. The locking adhesive shall be Loctite® 271 manufactured by Henkel Corporation, Westlake, OH, or approved equal.

D. BACKBOARD — STEEL:

1. Perforated steel backboard shall be No. 16 U.S. gauge steel plate perforated as shown on the plans, galvanized after perforation as hereinbefore specified, shall be secured to frame with hot-dipped galvanized stove bolts, sizes as shown in the plans. The frame for the backboard shall be made of recycled plastic lumber; lap jointed at corners and bolted together, all as shown on the plans. The recycled plastic frame shall remain unpainted.

E. PLASTIC LUMBER:

1. Shall be fabricated from at least eighty (80%) percent post-consumer recycled plastic as manufactured by Bedford Technology, LLC Worthington, MN, Tangent Technologies, LLC, Aurora, IL, or approved equal. Color to be black unless otherwise indicated on the plans. Submit sample for approval.

2. Recycled Plastic Lumber shall be fabricated primarily from High Density Polyethylene (HDPE) and Low-Density Polyethylene (LDPE) recycled polyethylene. HDPE resins shall meet requirements of ASTM D1248 for Type III or W (high density), Grade G7. Material shall contain no toxic materials. Recycled Plastic Lumber shall not absorb moisture, corrode, rot, warp, splinter, or crack and shall not contain fiberglass or any material that will be irritating when in contact with the skin.

F. BACKBOARD - POLYCARBONATE

1. Polycarbonate backboard shall be as manufactured TrueBounce Backboards, New Bedford, MA, model number XL7048, or approved equal. Dimension of backboard shall be as shown on the standard details or contract drawings. Backboard shall be made of half (1/2") inch unbreakable clear polycarbonate material, secured to frame with stainless steel bolts, sizes as shown in the plans.

The frame for the backboard shall be made of aluminum, lap jointed at corners and bolted together, all as recommended by the manufacturer.

G. CONCRETE FOOTING

1. Shall be 3,200 psi Average Concrete and shall meet requirements in Section 03 30 00 – Cast-in-Place Concrete.

H. STEEL BAR REINFORCEMENT

1. Reinforcement shall meet the requirements of the applicable paragraphs of the N.Y.C. Building Code and the latest ASTM specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement", Designation A-615 and shall be of the sizes and dimensions shown on the NYC Parks Standard Details.

I. GOAL

1. Goal shall be “Titan Super Goal”, Model No. 7555 as manufactured by Gared Sports, St. Louis, MO or “Heavy Duty Playground Goal” No. 00251-H00 as manufactured by Porter, Broadview, IL, or approved equal. Any equal must match complete backplate hole layout as shown on standard details. Goal shall be unconditionally warranted for a minimum of 10 years. The goal shall be made of steel rod welded to steel brackets bolted to backboard, all as shown on the plans. All metal parts shall be hot-dipped galvanized and powder coated as heretofore specified, after fabrication. Powder coating shall be color orange. Net is required.

2.02 BASKETBALL BACKSTOP – DOUBLE POST

A. POST

1. Post shall be galvanized steel, powder coated per this specification. All fittings for the backboard shall be as indicated on the standard details and shall be powder coated. Post and fittings shall be as manufactured by All City Play Equipment, Brooklyn, NY, or approved equal.

2. The cantilevered basketball backstop shall be attached to two 4-inch OD Schedule 80 (extra strong) galvanized and powder coated steel pipes, as indicated on standard details. The pipe shall conform to ASTM F1083.

3. Posts shall be reinforced with two (2) three-eighths (3/8") inch reinforcing bars and filled with average concrete as indicated on the plans and standard details.

B. POST CAP

1. Post shall be galvanized steel, powder coated per this specification. All fittings for the backboard shall be as indicated on the standard details and shall be powder coated. The post caps shall be cast of class 65-45-12 ductile iron, powder coated and secured as shown on the plans.

2. Where backstop is installed in line with fence, post caps shall be “line caps” as called for in Chain Link Fence item.

C. OUTRIGGERS

1. The outrigger shall be fabricated from 1.66” OD standard weight galvanized steel pipe, steel plate 2”x6”x3/8”, 1/4" thick pressed steel clamp, and 1/2" thick lugs. The post end of the 1.90 OD schedule 40 pipe shall be machined to a radius which conforms with the radius of the 1/4” pressed steel clamp. The steel plate, clamp and lugs shall be welded to the pipe ends as indicated on the standard details. The outrigger shall be galvanized, and powder coated after fabrication.

D. FASTENINGS

1. All fastenings shall be as indicated on the plans and the Contractor shall furnish and install all required bolts, drive and machine screws, pins, rivets, welds, and other fastenings necessary to complete the work, whether specifically indicated on the plans or not.

2. Bolts and nuts shall be galvanized after threading. The drive screws shall be of stainless steel. All fastenings shall be neatly sprayed with powder coat touch-up spray after installation.

E. TIE ROD AND TIGHTENER

1. The tie rod shall be 1/2" diameter galvanized and powder coated steel rod (except threaded ends which shall be sprayed with powder coat touch-up spray after installation), hooked at one end and threaded at the other; the tightener shall be formed from 3/8” thick galvanized and powder coated steel plate, as indicated on the standard details. The Contractor shall distress the tie rod threaded ends after installation and adjustment of frame.

F. ANGLE BRACE

1. The angle brace shall be 2 1/2"x2 1/2"x3/8” steel angle, hot dipped galvanized in accordance with ASTM A-36 and powder coated after fabrication per this specification.

G. BACKBOARD — STEEL:

1. Perforated steel backboard shall be No. 16 U.S. gauge steel plate perforated as shown on the plans, galvanized after perforation as hereinbefore specified, shall be secured to frame with hot-dipped galvanized stove bolts, sizes as shown in the plans. The frame for the backboard shall be made of recycled plastic lumber; lap jointed at corners and bolted together, all as shown on the plans. The recycled plastic frame shall remain unpainted.

H. PLASTIC LUMBER:

1. Shall be fabricated from at least eighty (80%) percent post-consumer recycled plastic as manufactured by Bedford Technology, LLC Worthington, MN, Tangent Technologies, LLC, Aurora, IL, or approved equal. Color to be black unless otherwise indicated on the plans. Submit sample for approval.

2. Recycled Plastic Lumber shall be fabricated primarily from High Density Polyethylene (HDPE) and Low-Density Polyethylene (LDPE) recycled polyethylene. HDPE resins shall meet requirements of ASTM D1248 for Type III or W (high density), Grade G7. Material shall contain no toxic materials. Recycled Plastic Lumber shall not absorb moisture, corrode, rot, warp, splinter, or crack and shall not contain fiberglass or any material that will be irritating when in contact with the skin.

I. BACKBOARD - POLYCARBONATE

1. Polycarbonate backboard shall be as manufactured TrueBounce Backboards, New Bedford, MA, model number XL7048, or approved equal. Dimension of backboard shall be as shown on the standard details or contract drawings. Backboard shall be made of half (1/2") inch unbreakable clear polycarbonate material, secured to frame with stainless steel bolts, sizes as shown in the plans. The frame for the backboard shall be made of aluminum, lap jointed at corners and bolted together, all as recommended by the manufacturer.

J. GOAL

1. Goal shall be “Titan Super Goal”, Model No. 7555 as manufactured by Gared Sports, St. Louis, MO or “Heavy Duty Playground Goal” No. 00251-H00 as manufactured by Porter, Broadview, IL, or approved equal. Any equal must match complete backplate hole layout as shown on standard details. Goal shall be unconditionally warranted for a minimum of 10 years. The goal shall be made of steel rod welded to steel brackets bolted to backboard, all as shown on the plans. All metal parts shall be hot-dipped galvanized and powder coated as heretofore specified, after fabrication. Powder coating shall be color orange. Net is required.

PART 3 EXECUTION

3.01 ERECTION

A. Posts shall be set in holes formed in new reinforced concrete footings; dimensions indicated on the Standard Detail. Posts shall then be set in holes and shall be grouted firmly in place with a grout composed of one part Portland Cement and two parts sand, or approved equal. Posts shall be erected truly vertical.

B. Where basketball backstop is installed in-line with fence, additional 1 5/8" rails shall be installed on fence as indicated on NYC Parks Standard Detail Sheet.

3.02 POWDERCOATING

A. All new backstop parts (except for steel or polycarbonate backboards) shall be powder coated with TGIC-Polyester; nuts, bolts and threaded ends of tie rods shall be neatly sprayed with powder coat touch-up after installation. No lacquer, urethane, or other coatings which would prevent proper adhesion of powder coating shall be applied to the parts.

B. The powder coating shall be applied in such a manner that the coating will not peel off. Ensure surfaces to be coated are clean, dry, and free of grease, dust, rust, etc. All coated parts shall first receive phosphating and chromatizing treatments to improve the adhesion of the surface coating. Color to be black unless otherwise indicated on the plans.

C. The TGIC-Polyester shall be applied at a film thickness of 3 to 4 mils by electrostatic spray process and bake finished per manufacturer's directions. The TGIC-Polyester shall be applied without voids, tears or cuts that reveal the substrate and shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

3.03 LABORATORY TEST FOR TGIC-POLYESTER POWDERCOAT

A. At the discretion of the Engineer, a sample TGIC-Polyester powder coated part shall be laboratory tested for bonding of the powder coating to the metal. The test shall be the Cross Hatch test, as per ASTM D3359, Method B. Failure to satisfactorily pass this test shall be a basis for rejection.

3.04 TOUCH-UP & REPAIR:

A. For minor damaged caused by installation or transportation, clean damaged area, then:

1. On damaged galvanized surfaces, apply organic zinc repair paint complying with ASTM A780, then repair powder coating per number 2 below. Galvanizing repair paint shall have 65 percent zinc by weight. Thickness of repair paint shall be not less than that required by ASTM A123.

2. On damaged powder coated surfaces, touch up finish in conformance with manufacturer's recommendations. Provide touch-up such that repair is not visible from a distance of six (6) feet.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 22 10 00
PLUMBING PIPING

PART 1 GENERAL

1.01 REQUIREMENTS

A. This Section describes copper tubing to be used for water supply piping. Under these items, the Contractor shall furnish, install and connect the water pipe of the size shown in accordance with the plans, specifications and directions of the Engineer.

B. This section describes the relocation of house service water connections to facilitate the installation of Green Infrastructure. These facilities will be removed and reinstalled in accordance with NYC DEP BWSO Standard Sewer and Water Main Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 32 90 05 – Soils Mixes

C. Section 31 23 16 – Excavation

D. Section 33 05 05.30 – Leakage Testing for Buried Pipe

.1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, and equipment necessary to complete the work, including fittings, joints, fine gravel or sand foundation (where needed), in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The price bid shall be unit prices per LINEAR FOOT of laying length of TYPE K COPPER TUBING – 1" DIAMETER.

C. The price bid shall be unit prices per LINEAR FOOT of laying length of TYPE K COPPER TUBING – 1-1/4" DIAMETER.

D. The price bid shall be unit prices per LINEAR FOOT of laying length of TYPE K COPPER TUBING – 2" DIAMETER.

E. The price bid for PLUG VALVE – 1" DIAMETER shall be a unit price per EACH.

F. The price bid for CUTTING AND OFFSETTING HOUSE SERVICE WATER CONNECTION (<3” DIA) shall be a unit price per EACH.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. NYC DEP BWSO Standard Sewer and Water Main Specifications (2022 or latest edition)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Contractor shall submit Shop Drawings for approval of the Engineer. Submittals shall include, but not limited to, the following:

A. Shop Drawings.

B. Results of Certified Shop Tests.

C. Certified Letters of Compliance.

B. Shop Drawings shall include, but not be limited to:

1. Catalog data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.

2. Details of pipe lining, coating, wrapping, insulation and painting of all pipe.

3. Tabulated pipe layout schedule shall include the following information for all pipe and fittings: service, pipe size, working pressure, joint type, wall thickness, piece number, and laying length.

4. Flexible couplings, with harness details if required.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 PIPE

A. The water service pipe shall be rigid (drawn) temper type "K" copper tubing in straight lengths meeting the specification for ASTM designation No. B88.

Exception: If the distance between the water tap to the curb valve is greater than ten (10’) feet or cannot be spanned with a single piece of rigid tubing, ductile (annealed) copper tubing may be installed, as approved by DEP and Parks.

2.02 FITTINGS

A. Fittings shall be approved wrought copper and bronze solder - joint pressure fittings (ANSI B 16.22), Di-Electric fittings as required

2.03 JOINTS

A. Joints shall be made by soldering, using 95-5 tin antimony solder. Except from the curb valve to the water tap, joints shall be of the "flared" type.

2.04 FOUNDATION MATERIAL

A. Selected foundation material shall conform to Section 32 90 05 – Soil Mixes and/or Section 31 05 16 – Aggregates for Earthwork

2.05 PLUG VALVE

A. Plug valves shall be of the cylindrical Plug Type with a closed bottom and a top seal, full enclosed one-quarter (¼) turn clock, straight through flow way which is resistant to turbulation of the flow stream, one piece cast bronze cylindrical plug and “T” head that aligns with the ports to provide a visual check of valve position, inside screw ends with I.P. threads, as is manufactured by Mueller Co. No. H-10283N, or approved equal. Adaptors are required for connecting to copper tubing.

2.06 OPERATING KEY

A. An approved operating key of proper size for each valve shall be furnished by the Contractor, except that the Contractor need not furnish more than two (2) keys for each type of valve, regardless of the quantity of valves called for in the Contract. The operating key shall be Mueller Co. H-10322N, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION AND FOUNDATION

A. The pipe shall be laid true to line and grade with a cover as indicated on the plans or as directed by the Engineer. When the foundation is good firm earth, the earth should be pared or molded to give full support and if necessary, a layer of fine gravel, sand or other suitable material should be placed. The same means of securing firm foundation should be adopted in case the excavation has been made deeper than necessary, in which case the Contractor shall furnish the fine gravel, sand or other suitable foundation material at his own expense.

B. Where the bottom of the trench is in rock, fresh fill, soil of low bearing power or other situations where special foundations are required, the Contractor shall provide such foundation in accordance with the written order of the Engineer. The work shall be paid for at the unit prices bid for the materials used in the work - Section 03 30 00 – Cast-in-Place Concrete.

3.02 TESTING

A. The Contractor shall not backfill over any pipe until ordered by the Engineer. The pipe system shall be tight and show no leaks when filled with water, sealed and subjected to an internal hydrostatic pressure of 100 psi for thirty minutes. Temporary caps shall be placed where required to permit making the tests where valves are not available. The tests shall be made in the presence of the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 31 05 16
AGGREGATES FOR EARTHWORK

PART 1 GENERAL

1.01 REQUIREMENTS

A. This Section describes the open graded stone base. The thickness and locations of the "open-graded- stone base" must be as shown on the Contract Drawings, or as determined by field conditions and ordered by the Engineer.

B. This Section describes the stone leveling course layer. The thickness and locations of the "leveling course" must be as shown on the DEP Standard Designs and Guidelines for Green Infrastructure Practices.

C. This Section describes the aggregate used for pipe and structure bedding. The thickness and locations of the “aggregate” must be as shown on the Contract Drawings, or as determined by field conditions and ordered by the Engineer.

D. This Section describes the river-washed stone used in channels for conveyance of stormwater. The thickness and locations of “river-washed stone” must be as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 32 90 05 – Soil Mixes

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the work, including preparation, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid for AGGREGATE shall be unit price per CUBIC YARD.

C. The price bid for WASHED CLEAN AGGREGATE shall be unit price per CUBIC YARD.

D. The price bid for RIVER-WASHED STONE shall be unit price per CUBIC YARD.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. NYSDOT Standard Specifications Coarse Aggregate Section 703.02

B. ASTM D 448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Contractor to submit sieve analysis data of each aggregate product intended for use following ASTM C136 – Testing method for Sieve Analysis of Fine and Coarse Aggregates.

B. Prior to the placement of the open graded stone base, the Contractor must submit a representative sample to the Engineer and obtain approval, in writing.

C. Contractor to submit documentation to certify that washed clean aggregate is free from contamination and/or organic matter. Contractor shall assume full responsibility for any contamination of any part of this base during construction and shall, at his own expense, remove any and all portions of this base which do not conform to the requirements of these Specifications and replace these portions with specified material.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 WASHED CLEAN AGGREGATE

A. OPEN GRADED STONE BASE/CLEAN CRUSHED STONE

1. All materials for GI practices that call for Open-Graded Stone Base/Clean Crushed Stone must comply with the latest N.Y.S. Department of Transportation Standard Specifications Coarse Aggregate Section 703.02. The material shall be per the Contract Drawings or per the manufacturer's specifications.

B. AGGREGATES FOR BIORETENTION

1. Clean gravel layer for use between engineered soil and crushed rock in Bioretention shall be No. 8 stone, as per ASTM D 448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction**.**

2.. Crushed rock for use in Bioretention shall be No. 6 stone, as per ASTM D 448 Standard Classification for Sizes of Aggregate for Road and Bridge Construction**.**

C. AGGREGATES FOR DRAINAGE IN A DRYWELL

1. Broken stone shall consist solely of crushed ledge rock. Stone shall be No. 3 or No. 4 size, as designated on the detail.

D. LEVELING COURSE LAYER

1. Leveling course layer for use below precast concrete chambers and cast-in-place concrete shall be of ASTM No. 89 stone.

2.02 PIPE BEDDING

A. Gradation for Small Piping: For pipe 18 inches or less in diameter, use pipe bedding material of which 90 percent 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 of which 90 percent will be retained on a No. 8 sieve, 100 percent will pass a 1-inch sieve, and will be well graded between those limits.

2.03 RIVER-WASHED STONE

A. River-washed stone shall be washed, rounded-river stone or cobble with an average diameter of 6 inches, minimum diameter of 4 inches, and maximum diameter of 8 inches. Angular stone such as rip-rap or #57 stone is not acceptable.
B. Stones shall be free of decomposed stone, clay rock dust and other objectionable material. Existing stone walls and broken concrete or recycled stone shall not be used as stones. Broken concrete is not acceptable.
C. Contractor shall provide sample of stone for approval by the Engineer prior to installation.

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONTRACT GI-CONS-7
SECTION 31 05 19
GEOSYNTHETICS FOR EARTHWORK

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes the High-Density Polyethylene ("HDPE″) Barrier. The purpose of the HDPE barrier is to provide an impermeable layer which does not allow water to pass through it. The HDPE barrier must be installed where directed by the Engineer, as shown on Contract Drawings and in accordance with the specifications and the directions of the Engineer.

B. The HDPE barrier must consist of HDPE geomembrane sheets not less than 80 mil thickness, meeting or exceeding Geosynthetic Research Institute ("GRI") Test Method GM 13.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 23 16 – Excavation

1.03 PAYMENT

B. The price bid shall be a unit price per SQUARE FOOT of HDPE BARRIER, and shall include furnishing, all labor, materials, and equipment, including, but not limited to water-tight sealant material, samples, and all incidentals necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. NYCDOT Standard Highway Specifications Section 1.06.31

B. Geosynthetic Research Institute ("GRI") Test Method GM 13

C. ASTM D5199 – Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

D. ASTM D1505 – Standard Test Method for Density of Plastics by the Density-Gradient Technique

E. ASTM D1004 – Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

F. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor, prior to the start of Work, shall submit to the Engineer for approval samples of the geomembrane in accordance with requirements of Section 01 33 00 – Submittal Procedures.

B. Certified material test reports showing that the geomembrane meets the specified requirements must be submitted for each shipment and identified with specific lots prior to installing materials. Material test reports must meet the requirements of ASTM and GRI test method GRI GM 13.

C. The manufacturer must submit certified test date to cover each shipment of the material.

1.07 QUALITY CONTROL (NOT USED)

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in clean, dry area in accordance with manufacturer's instructions.

C. Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 HDPE GEOMEMBRANE

A. HDPE geomembrane sheets supplied for the project must meet or exceed all required physical characteristics as defined below:

1. HDPE Geomembrane - High quality, high density polyethylene (HDPE) geomembrane specially formulated with virgin formulated polyethylene.

2. Thickness - Thickness must not be less than (minimum average) 80 mil, measured in accordance with ASTM D5199.

3. Density - The Density must not be less than 59 lb/ft^3, measured in accordance with ASTM D1505.

4. Tear resistance - Tear resistance must not be less than 40 lb, measured in accordance with ASTM D1004.

5. Puncture Resistance - Puncture Resistance must not be less than 100 lb, measured in accordance with ASTM D4833.

6. The HDPE Barrier must be strong enough to resist both rot and insects.

PART 3 EXECUTION

3.01 INSTALLATION

A. Prior to the installation of the HDPE Barrier, the Contractor shall excavate the GI practice area to the satisfaction of the Engineer in accordance with Section 31 23 16 - Excavation.

B. Install HDPE Barrier as indicated on the Contract Drawings.

C. The HDPE Barrier must be placed in one piece directly on the vertical face of the excavation. Splicing will be permitted at utility crossing per details provided in DEP Standard Designs and Guidelines for Green Infrastructure Practices. All splices must be sealed with a watertight seal.

D. No equipment, materials or machinery shall be placed on or be transported over exposed HDPE Barrier.

E. Care must be taken in the placement of backfill under other items so as to prevent dislocation of the HDPE Barrier. If the HDPE Barrier is ruptured during installation, the rupture must be covered with a patch of new HDPE Barrier that will overlap the undamaged area by at least twelve (12”) inches in all directions. No additional payment will be made for the repair.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 31 23 16
EXCAVATION

PART 1 GENERAL

1.01 REQUIREMENTS

A. Furnish all labor, equipment and materials required to complete all Work associated with excavation and disposal of all material, for the purpose of building green infrastructure practices, structures, conduits, pipelines, and other structures as well as grading and completing the Work in every respect.

B. Excavation Work includes stripping and stockpiling of topsoil, sheeting and bracing, excavation over the Site, excavation for roads, pipelines and structures, control of water, segregation and stockpiling of excavated material, disposal of unsuitable material and excess excavated material, and trimming, shaping, and grading of excavations, all complete and in place as shown on the Contract Drawings, specified and directed. The Work includes the excavation of any material which, in the opinion of the Engineer, is necessary to be excavated for any purpose pertinent to the construction of the Work. The requirements for clearing and grubbing are set forth in this Specification.

C. Contractor shall perform hand and/or pneumatic excavation in areas where trenching or other excavation is required, and in accordance with the plans, Specifications, and directions of the Engineer. Hand and/or pneumatic excavation is intended for, but not limited to, excavation within the drip line of existing trees and aged utilities.

D. Dust, Soil Erosion, Sediment Control and Stormwater Pollution Prevention: The Contractor's operations shall conform to the requirements of Section 01 57 13 – Temporary Erosion and Sediment Control, and Section 01 57 23 – Temporary Stormwater Pollution Control.

E. If clearing and grubbing is used, the requirements are as follows:

1. Clearing includes the removal from the ground surface and disposal, within the designated areas of trees, brush, shrubs, down timber, decayed wood, other vegetation, rubbish, trash, scrap metal, debris and miscellaneous other structures not covered under other Sections as shown on the Contract Drawings, specified or otherwise required to permit construction of the new Work.

2. Limits of clearing will be all areas within five (5) feet of the practice footprint or as noted on the Contract Drawings. Damage outside these limits caused by the Contractor's operations must be corrected at the Contractor's expense.

3. Streets, roads, adjacent property and other works and structures must be protected throughout the entire project. Contractor shall return to original condition, satisfactory to the Engineer, facilities damaged by the Contractor's operations.

4. Refer to Subsection 3.01 Execution herein regarding removal depth associated with clearing and grubbing.

F. If sheeting and bracing are used, the requirements are as follows:

1. Where the depth of excavation is greater than five (5) feet, the sides of the excavation must be supported by sheeting and properly braced. All sheeting and bracing systems used by the Contractor or ordered by the Engineer or the Department must comply with these Specifications and must receive the approvals stated herein. Timber sheeting and bracing must be vertical sheeting with ranges and braces, or horizontal sheeting supported by vertical steel soldier beams and the necessary bracing.

2. Where the material to be excavated is of such character as to render it necessary, the sheeting shall be tongued and grooved and driven to such depths below the subgrade as may be directed.

3. Where the nature of the material encountered or the safety of the adjacent structure render it necessary, the Contractor may resort to the use of steel sheet piling with pre-stressed bracing or the Contractor may underpin the structure or buildings. Permission and review by property owner is required before underpinning any structure.

4. Other sheeting systems may be permitted upon approval of DEP.

5. If, in the opinion of the Engineer, any of the approved temporary or permanent supporting structures are inadequate or unsuitable for the actual conditions in the field, the Engineer may direct the Contractor to strengthen the supporting structures at no additional cost to the City. The Contractor shall be responsible for the sufficiency of all temporary and permanent supporting structures whether or not directed by the Engineer to strengthen them.

6. Unless otherwise specified in the plans or these specifications, the Contractor shall remove all sheeting and bracing throughout this project as per Article 3.10 of this Specification.

G. The Contractor shall perform test pits to locate where buried utilities may conflict with proposed Green Infrastructure practices as shown in the Contract Documents, or as directed by the Engineer. Test pits shall be conducted in accordance with Section 02 30 00 – Test Pits.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 56 00 – Temporary Barriers and Enclosures

C. Section 01 56 39 – Temporary Tree and Plant Protection

D. Section 01 57 13 – Temporary Erosion and Sediment Control

E. Section 01 57 23 – Temporary Stormwater Pollution Control.

F. Section 01 74 20 – Construction Waste Management

G. Section 02 24 20 – Soil Sampling and Analysis

H. Section 02 41 10 – Demolition and Removals

I. Section 03 30 00 – Cast-in-Place Concrete

J. Section 32 90 05 – Soil Mixes

K. Section 32 12 16 – Asphalt Paving

1.03 PAYMENT

A. The price bid for EXCAVATION shall be the unit price per CUBIC YARD for areas as indicated on the Contract Drawings (e.g. bio-retention practices) and shall include the cost of all labor, saw cutting, materials, equipment, and incidental expenses necessary to complete the work, including preparation, sheeting, and shoring, complete test pit investigations, all in accordance with the plans and Specifications, to the satisfaction of the Engineer, and shall also include the cost of transport and disposal as solid waste or transport and beneficial reuse of excavated material meeting the definitions of Fill Types 2 through 5.

B. The price bid for EXCAVATION OF MAN-MADE MATERIAL shall be the unit price per CUBIC YARD for areas as indicated on the Contract Drawings and shall include the cost of all labor, demolition, saw cutting, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, sheeting, and shoring, all in accordance with the plans and Specifications, to the satisfaction of the Engineer, and shall also include the cost of transport and disposal as solid waste or transport and beneficial reuse of excavated material meeting the definitions of Fill Types 2 though 5.

C. The price bid for HAND/PNEUMATIC EXCAVATION shall be unit price per CUBIC YARD for areas as indicated on the Contract Drawings and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, sheeting, and shoring, complete test pit investigations, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

D. The price bid for CLEARING AND GRUBBING shall be unit price per SQUARE FOOT for areas as indicated on the Contract Drawings and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the work, including preparation and disposal all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

E. The price bid for OFF-SITE BACKFILL shall be the unit price per CUBIC YARD for areas as indicated on the Contract Drawings and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including the cost of locating, arranging, testing (if required), handling, management, and transport of excavated material generated off-site and delivered to the Project Site for use, and meeting the definitions of OFF-SITE BACKFILL.

F. The price bid for ON-SITE BACKFILL shall be the unit price per CUBIC YARD for areas as indicated on the Contract Drawings and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including the cost of on-site handling, transport, and management of excavated material generated on the Project Site and being reused at the location of origin. ON-SITE BACKFILL must not exhibit visual or historical evidence of contamination.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM C131 - Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

B. ASTM C143 - Slump of Portland Cement Concrete

C. ASTM C330 - Lightweight Aggregates for Structural Concrete

D. ASTM D422 - Standard Test Method for Particle Size Analysis of Soils

E. ASTM D698 - Test Method for Laboratory Compaction in Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600 kN- m/m^3)

F. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

G. ASTM D1557 - Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3)

H. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

I. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

J. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

K. ASTM D4832 - Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Cylinders

L. ASTM D6023 - Test Method for Unit Weight, Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low Strength Material (CLSM)

M. ASTM D6024 - Test Method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application

N. Occupational Safety and Health Administration, U.S. Department of Labor

O. Board of Appeals, N.Y.S. Department of Labor

P. New York City Rules and Regulations ("RCNY")

Q. New York State Department of Transportation ("NYSDOT")

R. New York City Department of Transportation ("NYCDOT")

S. New York State Department of Environmental Conservation ("NYSDEC")

T. 6 NYCRR Part 375 Environmental Remediation Programs

U. U.S. Department of Transportation, Federal Highway Administration

V. U.S. Environmental Protection Agency

W. New York City Building Code

X. DEP General Specification 11 – Concrete

Y. 6 NYCRR Parts 360-366 and 369, Solid Waste Management

Z. 6 NYCRR Part 364 Waste Transporters

AA. NYC Local Law No. 72 (2019 – Hazardous Level of Lead in Soil Notification)

BB. 40 CFR 761.61 Toxic Substances Control Act (TSCA) PCB Remediation Waste

1.05 REGULATORY COMPLIANCE

A. General: Before proceeding with any excavation, obtain all necessary permits required by City Departments having jurisdiction except where a license or easement has been obtained by the City.

B. Excavation operations and related Work must be performed in strict compliance with, the applicable sections of OSHA 1926 Subpart P-Excavations, NYS Department of Labor, Industrial Board of Appeals, Part 23 Protection in Construction, Demolition and Excavation Operations latest editions.

C. In the period of two (2) to ten (10) days prior to starting excavation, notify all utilities of intended Work locations and have utility locations marked. In NYC, the New York City Long Island One Call Center (800-272-4480) is available for this use.

D. New York Codes Rules and Regulations Title 6 (6 NYCRR) Subpart 375 Environmental

Remediation Programs applies to sites in one of three environmental remedial programs: 1. the inactive hazardous waste disposal site program; 2. the brownfield cleanup program; or 3. the environmental restoration program. Subpart 375 contains numerical soil cleanup objectives (SCOs) used for the remediation programs and for comparison of laboratory analysis results to characterize excavated materials for beneficial use under 6 NYCRR Subpart 360.

E. 6 NYCRR Part 360 Series Solid Waste Management including Part 364 Waste Transporters governs registered and permitted solid waste facilities, landfills, regulated solid waste transport and beneficial use of solid waste including for construction projects on sites that are not part of an environmental remediation program (see paragraph D).

F. New York City Local Law No. 72 requires city development projects undertaken by an agency to perform notification and air monitoring when hazardous concentrations of lead are detected in soil.

G. Control air pollution caused by dust and dirt and comply with governing regulations. Dust control will be as specified in Section 01 57 13 – Temporary Erosion and Sediment Control and Section 01 57 23 - Temporary Stormwater Pollution Control.

1.06 SUBMITTALS

A. All submittals must be in accordance with the requirements of the Section 01 33 00 – Submittal Procedures.

B. Sheeting and Bracing: Before commencing any excavating operations, submit for approval, in accordance with the provisions of the General Conditions, working drawings of all sheeting and bracing, bridging, decking, soldier beams and lagging, and other temporary or permanent supporting structures. Shoring and underpinning submittals shall be as required by Subsection 3.09 herein – Sheeting and Bracing, and Subsection 3.09 herein– Sheeting and Bracing Shop Drawings.

1. Working drawings must show types of materials, dimensions and details of the entire bracing system, including wale splices and corner connections, stressing/jacking methods, reaction systems, posting and rebracing, if necessary.

2. Provide plans, details, and procedures for jacking-in preload at struts.

3. For sheeting and shoring not shown on the Contract Drawings submit engineering calculations and design assumptions for determination of loads and stresses acting in the wall and lateral supports during installation, as well as final conditions. Show locations at which the temporary or permanent supporting structures will be used. The proposed design must take into account the excavation procedures, surcharge loading, soil properties, material stresses, temperatures, permanent construction, stages of Work and all other conditions which could affect the excavation support system and the permanent structure. These drawings and calculations must be prepared and stamped by a Professional Engineer licensed in the State of New

York.

C. Soil Excavation, Transport and Disposal Plan: Submit a Soil Excavation, Transport and Disposal Plan to the Engineer for approval at least thirty (30) calendar days prior to the start of excavation. This Soil Excavation, Transport and Disposal Plan shall include soil classification activities for soil to be beneficially reused onsite, beneficially reused offsite or disposed offsite, excavation methods, transportation, and disposal protocols to be used for the following categories of regulated waste and fill material that ceases to be solid waste when beneficially reused:

1. Industrial-Commercial Waste as defined in 6 NYCRR Part 364-1.2(e)(10)
2. Fill Type 2 (F2)
3. Fill Type 3 (F3)
4. Fill Type 4 (F4)
5. Fill Type 5 (F5)
6. Petroleum-Contaminated Soil that does not meet the definition of "Fill"
7. Construction and Demolition (C&D) Debris
8. Hazardous Waste
9. TSCA Bulk PCB Remediation Waste as defined in 40 CFR 761.61

The Soil Excavation, Transport and Disposal Plan shall be prepared by a QEP in accordance with all applicable Federal, State, and local hauling and disposal codes and regulations. All variants of blank forms to be used by the Contractor for notification and tracking of excavated material shall be included as attachments to the plan and labeled as to which category of material each form applies.

1. Excavation protocol must include, but not be limited to, the following:
    a. Limits of excavation
    b. Protection methods:
        i. Sheeting and bracing
        ii. Fencing, bridging and decking

2. Transport and Disposal protocol shall include the following:

    a. Identities of disposal or beneficial reuse facilities solicited including names and locations, insurance certificate, registration or permit documentation including the types of materials allowed and not allowed, and chemical and physical material acceptance criteria. If no concentrations are indicated, then the facility will indicate the types of material that it is allowed to accept under its permit. If not beneficially reused, waste generated by excavation Work must be transported to a facility registered or permitted to accept such waste by the Environmental Protection Agency (EPA) or an authorized state or local government agency. Such facilities include handling and recovery facilities such as construction and demolition debris handling and recovery facilities (CDDHRF), RCRA Subtitle D landfills, or in the case of hazardous waste, treatment, storage, and disposal (TSD) facilities or RCRA Subtitle C landfills.

b. Identities of waste transporters and supporting DEC Part 364 Waste Transporter Permit(s) required to transport the wastes to the CDDHRF or TSD facilities or landfills.

c. Provisions for submittals for DEP signature as generator. The Contractor shall provide waste profiles, advance copies of waste manifest(s) or bills-of-lading, and Land Disposal Restriction ("LDR") Notification and Certification Form (if hazardous waste) for the Engineer's review and approval and DEP signature as generator.

d. The Soil Excavation, Transport and Disposal Plan must be coordinated with the Field Sampling Plan ("FSP") and waste disposal facility selection and materials acceptance requirements specified in Section 02 24 20 – Soil Sampling and Analysis.

D. Manifest Requirements and Submittals: Manifests must include measurements of the volume of all excavated material to be removed from the site prior to transporting to an approved beneficial use site or disposal facility. The Contractor shall also prepare all vehicles and manifests/bills of lading necessary for transporting all material. Non-hazardous waste must be manifested in a fashion similar to that for hazardous waste using bills-of-lading or other tracking forms approved by the Engineer. The Contractor shall comply with all Federal, State, and local regulations regarding the transport of hazardous and nonhazardous waste.

1. Applicable Regulations: All project Work that concerns the transport of hazardous and non-hazardous waste must comply with the appropriate EPA and DEC regulations and DOT hazardous material transportation regulations.

2. EPA Hazardous Waste Manifest: The Contractor shall obtain an appropriate number of hazardous waste manifest forms (EPA Form 8700-22 (Rev. 3-05) or latest version, sequentially numbered for this project based on the quantity of hazardous waste to be removed from the Site. The name of the generator, transporter and disposal facility, and their appropriate EPA identification number, shall be typed on each form. All other pertinent information shall be included on the manifest. A copy of the partially completed manifest including the above information shall be submitted for approval at least three (3) weeks prior to commencement of excavation.

3. Routing: The Contractor shall provide a map and written description of the route which will be taken to the approved treatment, storage or disposal facility by the hazardous waste transporter.

4. Non-hazardous Waste Manifest: Material classified as non-hazardous must be transported and measured in a similar manner to that specified for hazardous material. Manifests, bills-of-lading, or equivalent tracking forms must be provided for each truckload of material removed from the site. The form of the manifest

must be approved by the Engineer. Nonhazardous waste must be transported in accordance with all applicable Local, State and Federal DOT regulations by properly licensed and permitted waste haulers.

5. Pre-Determined Beneficial Use Materials: The QEP shall notify NYSDEC per 6 NYCRR Part 360.13 for the beneficial use of excavated material off site and track such use in the following cases:

   a. Notification in the City of New York. For Fill Type 2, Fill Type 3, Fill Type 4, and Fill Type 5 generated within the City of New York, notify NYSDEC at least five days before the first load greater than 10 cubic yards is planned to be transported from the site of excavation directly to a site of reuse. Notifications must be made on the form described in 6. below including analytical data required (refer to Section 02 24 20 1.04 A for a list of laboratory analyses).

6. The QEP shall notify NYSDEC using the NYSDEC Notification of Fill Material Reuse form at:
   https://extapps.dec.ny.gov/docs/materials_minerals_pdf/budfillnotify.pdf

7. Routing: The Contractor shall provide a map and written description of the route which will be taken to the approved CDDHRF, landfill or beneficial reuse site by the non-hazardous waste transporter.

8. The Contractor shall submit written evidence that selected CDDHRF, TSD, landfill or beneficial reuse facilities have accepted or will accept the wastes generated during excavation. The Contractor shall also submit copies of the completed manifest, bill-of-lading, or equivalent tracking form, signed and dated by the initial transporter, in accordance with Federal and State requirements and with associated documentation (e.g., Waste Profile and Hazardous Waste Land Disposal Restrictions (LDR) Notification and Certification Form). Copies of completed and signed waste manifests, bills-of-landing or tracking forms shall be provided to the Engineer within seven (7) days of waste shipment offsite.

E. The Contractor shall submit in advance the proposed method of hand and/or pneumatic excavation. If a device other than the Air-Spade is proposed, all product literature must be submitted for review.

F. Off-Site Backfill:

1. Name and location of all suppliers.

2. Certificate of compliance with standard specified for each source of material.

3. Prior to stockpiling or placing of off-site backfill materials at the job site, submit for approval approximately 100-pound samples representative of the fill at the proposed borrow source. In addition, submit documentation of the availability of the required fill quantities at any proposed borrow source.

4. Submit optimum moisture - maximum density curves and reports for all fill material before placement of fill.

5. Results of all compaction tests for fill placement.

6. Mix design for flowable fill, including all materials used and trial mix test results.

7. Certification by the lightweight fill producer of the gradation, dry loose unit weight, dry compacted unit weight and Los Angeles Abrasion Test loss for the proposed lightweight fill source.

G. Prequalification of testing laboratory for Soil Density Testing

1. Prior to start of Work, the Contractor shall submit to the Engineer the name, address, and phone number of each of three (3) independent testing laboratories, for consideration as the Soils Testing Laboratory for this project.

2. All proposed testing laboratories must be completely independent from the Contractor or any subsidiary thereof.

3. All proposed testing laboratories must be duly licensed by the NYCDOB, such license to be maintained for the duration of the project. Testing laboratories licensed outside of New York may be considered subject to the prior approval of the Engineer.

4. All proposed testing laboratories must have a proven record of performance in providing the soil testing services specified under this section.

5. The Engineer will select one (1) testing laboratory from the list of three (3) submitted, to perform the Work required under this Section. The Engineer reserves the right to select an alternate testing laboratory if all proposed laboratories are deemed unacceptable.

6. It is understood that no subcontract for the performance of required soil testing work will release the Contractor from the Contractor's responsibility under the contract to execute all Work in conformance with the project plans and Specifications.

1.07 QUALITY CONTROL (NOT USED)

1.08 DESIGN REQUIREMENTS

A. In designing the sheeting, take note of the minimum load diagram requirements of the Department of Environmental Protection, shown in Attachments A and B at the end of this Section, unless otherwise shown on the Contract Drawings or in the Standard Specifications. However, when it is anticipated that heavier crane or equipment loads will fall within the influence line of the excavation, increase design loads accordingly.

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1.09 SPECIAL REQUIREMENTS

A. For tree work to be performed within the Longhorned Beetle Quarantine Zone, the Contractor shall utilize the service of a Subcontractor certified by the New York State Department of Agriculture and Markets. Due to current Federal, State and NYC Parks policy, any wood waste that is generated must be completely chipped within the Quarantine Zone, by said certified Subcontractor. Log splitting equipment, where necessary, shall be utilized at no extra cost to the City. The Contractor shall notify NYC Parks Borough Forester, a minimum of 48 hours in advance of any work. Also, see requirements listed under heading "Submittals". Additional information can be found in DEP Standard Specifications for On-Site Green Infrastructure Section 01 56 39 – Temporary Tree and Plant Protection.

1.10 CERTIFICATION OF LABORATORY SERVICES

A. For certification of Laboratory Services see Section 02 24 20 – Soil Sampling and Analysis.

1.11 SITE CONDITIONS

A. Actual Conditions: Perform any geotechnical investigations deemed necessary to determine actual site conditions. Verify locations requiring Exploratory Excavation as indicated on the Contract Drawings. Geotechnical data reports, if they are available, will be described in the Standard Specifications.

B. Underground Utilities: Locate and identify all existing underground utilities prior to the commencement of Work.

1.12 PROTECTION OF PROPERTY

A. Streets, roads, adjacent property and other works and structures shall be protected throughout the entire project.

B. Trees, shrubs and grassed areas which are to remain shall be protected by fences, barricades, wrapping or other methods as directed, specified or approved by the Engineer. Equipment, stockpiles, etc., will not be permitted within tree branch spread. Trees must not be removed without approval of the Engineer unless shown or specified.

C. The Contractor shall guarantee that Work performed under this Section will not permanently damage trees, shrubs, turf or plants designated to remain, or other adjacent Work or facilities.

1.13 DEFINITIONS

A. Excavation

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1. Excavation includes the removal and disposal of all materials of whatever nature encountered in the prosecution of the Work, unless otherwise specified. All materials of whatever nature encountered will be defined as including, but not be limited to, the following:

   a. soil;

   b. stones;

   c. soft weathered rock that can be excavated by mechanical means other than air hammer or drilling and blasting;

   d. miscellaneous fill and refuse, anything thrown away or rejected as worthless or useless (both organic and inorganic material) that can be excavated by mechanical means other than air hammer or burning and cutting;

   e. sidewalk pavements (all types) and curbs (all types) within limits of trenches and excavations and cutbacks;

   f. tree stumps;

   g. abandoned pipes.

2. Excavation <u>does not</u> include the following which may materially affect the cost of removal and disposal to the Contractor, as determined by the Engineer:

   a. Industrial-Commercial Waste as defined in 6 NYCRR Part 364-1.2(e)(10) not meeting the requirements of Fill Types 4 or 5.

   b. Petroleum-Contaminated Soil that produces objectionable petroleum odors or does not meet the requirements of Fill Types 4 or 5.

   c. Construction and Demolition (C&D) Debris not meeting the requirements of Fill Types 4 or 5.

   d. Hazardous Waste including soil that exhibits one or more characteristics of a hazardous waste or soil that contains hazardous constituents from a listed hazardous waste. Also includes wastes containing PCBs >50 ppm in New York State.

   e. TSCA PCB Remediation Waste as defined in 40 CFR 761.61.

   f. Asbestos-containing waste (included in definition of C&D Debris).

   g. Existing man-made objects or structures that are not shown on the Contract Drawings or indicated in the Specifications, that could not reasonably have been anticipated by the Contractor, were not anticipated by DEP.

3. In case any of the items in Paragraph 2 above need to be excavated and disposed of, a separate Contract item is included in this Contract. Payment for the Work associated with control and handling, transportation, and offsite disposal of unforeseen regulated solid waste listed in 2.a. to 2.g. shall be made under General Allowance Item A-1 (see Section 02 26 00 – Hazardous Material Assessment).

B. Exploratory Excavation

1. Exploratory excavation is to take place in locations identified in Contract Drawings and verified on site. This Work involves the removal of surface pavement/soil to verify the underground infrastructure or for obtaining information on the subsurface conditions (e.g. cause of settling pavement).

C. Excavation of Man-Made Material – Excavation of existing man-made objects or structures that differ from the definition of Excavation as outlined in section A above. Determination of Man-Made Material shall be by the Engineer and DEP.

D. Excavation of Boulders in Open Cut – Excavation of boulders in open cut must include the excavation, removal and disposal of boulders or parts thereof from within the excavation limits, more than one-half (1/2) cubic yard in volume. The term boulders as used herein must include riprap, rock fill, thrust blocks and loose masonry, and does not include pavement and pavement foundation, or existing sewer or water main structures.

E. Suitable Material - Any material whose composition is satisfactory for use as fill. Any mineral (inorganic) soil, blasted or broken rock and similar materials of natural or man-made (i.e. recycled) origin, including mixtures thereof, are considered suitable materials. Determinations of whether a specific natural material is suitable shall be made by the Engineer on the above basis.

F. Unsuitable Materials – Any material containing vegetable or organic matter such as muck, peat, organic silt, topsoil or sod, that is not satisfactory for the use as fill material.

G. Excavated Material - all material regardless of its nature, except rock or boulders that have been excavated. Excavated material includes the categories of fill and regulated solid waste in this subpart.

H. All backfill, Off-Site or On-Site Backfill, must be sampled in-situ and tested as directed by the Engineer to confirm the material meets the requirements in Section 1.13. Sampling must be done in accordance with Section 02 24 20 – Soil Sampling and Analysis.

I. Off-Site Backfill: Soil and similar material excavated or brought to the Project Site for the purposes of construction. Fill from an off-site source shall be non-hazardous and meet the definitions of Fill Types 1 or 2 unless it originates from a virgin source such as a permitted mine or quarry. Material to be excavated and proposed for reuse as fill under Pre-Determined Beneficial Use must meet the requirements of 6 NYCRR Part 360, Section 360.13 (a), Applicability, Section 360.13 (b), Waste Cessation, or Section 360.12(c)(1)(iv)(a). If these criteria cannot be met, such material shall meet Section 360.12(d), Case-specific beneficial use determinations - general.

J. On-Site Backfill: Soil and similar material excavated on the Project Site for the purposes of construction and kept on-site for reuse. Material ceases to be waste when used as backfill in the same excavation or for grade adjustment on the site of

generation. If the material exhibits visual or historical evidence of contamination, it is no longer considered On-Site Backfill and must be disposed of off-site unless otherwise approved by the Engineer in writing.

K. Pre-Determined Beneficial Use for fill material: Under 6 NYCRR Part 360, Section 360.13(b) Waste cessation. "Excavated material ceases to be solid waste in accordance with the following:

1. Fill Type 1 generated outside of the New York City Metropolitan Area Waste Impact Zone (NYCMAWIZ) – once a determination has been made that the material is Fill Type 1;
2. Fill Type 1 generated within Nassau, Suffolk, Westchester and Putnam Counties – once the material is delivered to the site of reuse;
3. Fill Type 1 cannot be generated within the City of New York;
4. Fill Type 2 and Fill Type 3 generated outside of the NYCMAWIZ – once a determination has been made that the material is Fill Type 2 or Fill Type 3;
5. Fill Type 2 and Fill Type 3 generated within the NYCMAWIZ – once the material is delivered to the site of reuse;
6. Fill Type 4 and Fill Type 5 – Once the material is delivered to the site of reuse."
7. Under 6 NYCRR Part 360, Section 360.12(c)(1)(iv)(a), "Excavated material used to backfill the same excavation or as grade adjustment in areas of similar physical characteristics on the site of generation. If the material exhibits visual or historical evidence of contamination (including odors) and will be used in an area with public access, the material must be covered with pavement, foundation, or with a minimum of 12 inches of soil or fill that meets the criteria to be used as Fill Type 1 and Fill Type 2" as defined in Subdivision 360.13, Special requirements for pre-determined beneficial use of excavated material. Refer to Section 02 24 20 – Soil Sampling and Analysis for sampling requirements, including a list of parameters to be analyzed for soils to be reused on-site, or soils to be reused or disposed off-site.
8. As per 6 NYCRR Part 360, Section 360.13.(c), Notification requirements in the City of New York. For Fill Types 2 through 5, NYSDEC shall be notified at least five (5) days before the first load greater than ten (10) cubic yards is planned to be transported from the site of excavation directly to a site of reuse within New York State. Notifications shall be made on forms acceptable to NYSDEC and shall include all associated analytical data reports.
9. Notification of fill placement. For Fill Types 4 and 5 generated outside the City of New York, NYSDEC shall be notified at least five days before the first load greater than ten (10) cubic yards is planned to be transported directly from the site of excavation to the site of reuse within New York State. Notifications shall be made on forms acceptable to NYSDEC and shall include all associated analytical data reports.

L. Regulated Solid Waste – material from excavations in the following categories that do not meet the definition of fill in Section 1.13 paragraph I:

1. Industrial-Commercial Waste as defined in 6 NYCRR Part 364-1.2(e)(10) not meeting the requirements of Fill Types 4 or 5
2. Petroleum-Contaminated Soil that produces objectionable petroleum odors or does not meet the requirements of Fill Types 4 or 5
3. Construction and Demolition (C&D) Debris not meeting the requirements of Fill Types 4 or 5
4. Hazardous Waste including soil that exhibits one or more characteristics of a hazardous waste or soil that contains hazardous constituents from a listed hazardous waste. Also includes wastes containing PCBs >50 ppm in New York State
5. TSCA PCB Remediation Waste as defined in 40 CFR 761.61
6. Asbestos-containing waste (included in definition of C&D)

M. Qualified Environmental Professional (QEP) - A person who possesses sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding the presence of releases or threatened releases to the surface or subsurface of a property or off-site areas, sufficient to meet the objectives and performance factors for the areas of practice identified in 6 NYCRR Subpart 360. The qualified environmental professional must:

(i) hold a current professional engineer's or a professional geologist's license or registration issued by the State or another state, and have the equivalent of three years of full-time relevant experience; or
(ii) be a site remediation professional licensed or certified by the Federal government, a state or a recognized accrediting agency, to perform investigation or remediation tasks consistent with department guidance, and have the equivalent of three years of full-time relevant experience.

PART 2 PRODUCTS

2.01 OFF-SITE OR ON-SITE BACKFILL - GENERAL (NOT INTENDED FOR PLANTING)

A. Backfill with suitable materials, free from manmade debris, solid waste, organic matter, rubbish, boggy or other materials determined to be unsuitable.

1. Off-site Backfill: Fill that is brought onsite to be used as backfill must be tested and classified as Fill Types 1 or 2 unless prior approval in writing is obtained from the Engineer.

2. On-site Backfill: Excavated material removed and stockpiled, onsite, may be reused as backfill if it meets the requirements of 6 NYCRR Part 360.12(c)(1)(iv)(a).

3. The Contractor shall take such borings and make such sieve analyses as the Contractor may deem necessary to schedule the Contractor's operations consistent with the need of having an adequate supply of satisfactory backfill material originating on- or off-site and available along the line of the installation Work so that the Contractor may proceed without undue interruptions. No payment will be allowed to the Contractor for delays or other expenses incurred because satisfactory backfill material is not available at the proper time and place, and no allowance will be made to the Contractor for disposing of unsatisfactory backfill material imported to the site.

4. Recycled materials that the Engineer has evaluated and approved for general use shall be considered to be suitable material subject to the conditions for use as determined by the City. In general, the use of recycled materials must be sanctioned by NYSDEC, usually in the form of a BUD. See definition below.

B. Pre-Determined Beneficial Use Determination (BUD) – NYSDEC allows excavated material to be used to backfill in the same excavation or as grade adjustment in areas of similar physical characteristics on the site of generation. If the material exhibits visual or historical evidence of contamination (including odors) and will be used in an area with public access, reuse of the excavated material onsite must be approved in writing by the Engineer and must be covered with pavement, foundation, or with a minimum of 12 inches of soil or fill meeting the definition of Fill Types 1 or 2.

C. All material for backfilling must have a moisture content and gradation suitable for attaining the required density.

D. The maximum stone size must be two-thirds of the thickness of the backfill lift, but in no case shall material containing stones over ten (10) inches in the largest dimension be used for backfill.

E. Do not use wet or frozen material for backfilling.

2.02 QUALITY CONTROL

A. Testing: The Contractor shall retain the services of an independent materials testing laboratory to perform the following laboratory and field tests.

B. All materials used in construction shall be tested for optimum moisture-maximum density curve, and reports of the test results for each source shall be submitted promptly. The tests will be as follows:

Test	ASTM STANDARD	Tests Per Volume Delivered
Gradation	D422	1 per 200 C.Y.
Compaction or Density	D1557	1 per 200 C.Y.

C. Acceptability of completed compaction must be demonstrated by tests performed by the Contractor and accepted by the Engineer. The minimum number of tests will be determined by quantity of material placed, and reports of the test results must be submitted promptly. The Contractor shall perform either of the following tests subject to the approval of the Engineer:

Test	ASTM STANDARD	Tests Per Volume Placed
In-Place Density	D2167 D2922	1 per 200 cy

D. Any off-site backfill material (imported/not originating onsite) that is composed of soil or a mixture of soil, excluding quarry products such as gravel, crushed stone, limestone screenings, or other granular materials, must comply with the following protocol:

1. Contaminant concentrations shall be consistent with those required for Fill Types 1 or 2 unless otherwise approved in writing by the Engineer.

2. Testing of off-site backfill must include laboratory analysis and reporting for metals, PCBs/pesticides, and semivolatile organic compounds listed in 6 NYCRR Subpart 375-6.8(b). Additional laboratory analysis for volatile organic compounds listed in the same subpart to be performed if there is evidence of petroleum spills, odors, PID readings or other indications of contamination with volatile constituents. Fill material with the potential to contain asbestos is prohibited for import. Laboratory analyses must be performed by a laboratory currently certified by the New York State Department of Health's Environmental Laboratory Approval Program (ELAP).

3. The frequency of testing per volume of off-site backfill shall be in accordance with 6 NYCRR Part 360.13 (e)(1), Table 1, Minimum Analysis Frequency for Fill purchased from a registered/permitted processing or recycling facility.

2.03 SHEETING AND BRACING

A. Steel for struts, braces, and whalers must meet the requirements of Section 01 33 00 – Submittal Procedures.

B. Timber sheeting and bracing must be of new or acceptable used timber free from injurious defects.

C. Steel Plates for use as sheeting will be permitted, provided that they are properly installed and supported. The use of steel bracing frames which partially support the steel plates will be permitted up to a depth of twelve (12) feet. The use of steel plates in conjunction with trench boxes will not be permitted (trench boxes cannot be considered as steel bracing frames).

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PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. The Contractor shall remove from the Site and satisfactorily dispose of all trees up to and including six (6) inches in diameter breast height, shrubby growth, vines, ground covers, stumps of all sizes, roots and weeds, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and other miscellaneous structures not covered under other Sections as shown, specified or otherwise required to permit construction of the new Work. Cleared material in quarantine zone must be chipped as described in Section 1.09.

B. No cleared or grubbed material may be used in backfills or structural embankments.

C. No trees or shrubs shall be removed except as ordered by the Engineer.

D. Clearing and grubbing under the drip line of existing trees shall be performed by hand methods only. Tree protection fences shall not be moved or removed without the written permission of the Engineer.

E. When directed, objectionable subsurface material, as heretofore described, shall be removed to a depth of six (6) inches.

F. Burning on Site is not permitted.

G. All burning off-site must adhere to the rules and regulations of local authorities having jurisdiction.

H. Trees and shrubs to remain will be pruned in accordance with Section 01 56 39 – Temporary Tree and Plant Protection to avoid inadvertent mechanical damage. Pruning will be conducted under the guidance of an approved ISA Certified Arborist, and at the direction of the Engineer. The Contractor shall replace trees and shrubs intended to remain, that are either damaged beyond repair or had been removed at Contractor's expense.

3.02 PROTECTION OF UNDERGROUND UTILITIES

A. Determine location of subsurface utilities and perform Work in a way that shall avoid possible damage. Hand excavate as required. The Contractor assumes responsibility for damage to subsurface utilities when excavating and is required to call “One Call” at 800-272-4480, a service that marks subsurface facilities on the surface, prior to excavation. Maintain grade stakes set by others until removal is approved by Engineer. However, the Contractor is advised that the locations of City-owned infrastructure will not be obtainable through One Call, and instead, the Contractor must call DEP for information about its water and sewer infrastructure locations as set forth in the Subsection 1.05.C above– Regulatory Compliance. It is the Contractor’s responsibility to determine the location of the City-owned infrastructure distribution systems. In addition to obtaining DEP’s records as set forth above, the Contractor shall also make its own field observations to determine the location of such facilities before the commencement of any excavation. The Contractor

will be responsible for the cost of all repairs to such City-owned water and sewer infrastructure that are required as a result of its Work, and shall pay such costs upon demand by DEP.

3.03 PROTECTION OF PLANTS AND STRUCTURES

A. Before starting excavation, clear away all obstructions which are to be removed or relocated. Properly brace and protect trees, shrubs, poles and other structures which are to be preserved

B. Trees, shrubs and grassed areas which are to remain must be protected by fences, barricades, wrapping or other methods as shown, specified or approved by the Engineer and be replaced at no added cost to the City in the event they are destroyed or damaged as a result of excavation by the Contractor. Trees must not be removed without approval of the Engineer unless shown on the Contract Drawings or specified herein.

3.04 STRIPPING OF TOPSOIL

A. Completely strip all topsoil and earth containing roots away from areas which have been cleared and grubbed.

B. Topsoil must be disposed of per the Transport and Disposal Plan.

3.05 EXCAVATION

A. The Contractor shall excavate all materials to the established lines and grades for the construction of all facilities included in this Contract, or as shown and specified, in accordance with the requirements of the latest NYCDOT Standard Highway Specifications Sections 6.02 and 8.02, except as otherwise specified herein. Excavation must include removing boulders of size less than one-half (1/2) cubic yard. The limits of excavation shown on the Drawings indicate the extent of Work to be performed by the Contractor. The Contractor shall furnish and install any temporary side slope supports, bracing, and sheet piling required to perform the excavation to the depths and limits indicated.

B. Prior to starting the Work, the Contractor shall submit to the Engineer for approval, a detailed description of the method it proposes to use to prevent the collection of water in excavation during construction, including a coordinated sequence of operation for the entire project. Such prevention must include, but not be limited to, providing drainage and diversion of runoffs by means of sandbagging and/or removal by pumping. Approval by the Engineer will not relieve the Contractor of his responsibility for the safety of the Work, existing structures and adjacent property.

C. Site Excavation: Excavate over the Site within the limits of site grading to conform to finished site grades. Arrange the excavation Work to permit continuous surface drainage off the site, eliminate low spots and surface ponding, and prevent runoff from flowing into the surrounding areas.

D. Trench Excavation:

1. Maintain the minimum trench width adequate to place, joint and backfill the pipe or conduit properly. The clear width of the trench at the level of the top of the pipe must not exceed the sum of the outside diameter of the pipe barrel plus twenty (20) inches for pipe 4 through twenty-four (24) inches in diameter nor the outside diameter of the pipe barrel plus two (2) feet for pipe more than twenty-four (24) inches in diameter, unless otherwise approved by the Engineer. The banks of pipe trenches must be as near to vertical as practicable.

2. Length of Excavation: Make excavation for the sewers, drains, ducts, conduits or pipe lines only a reasonable distance in advance of pipe laying, at the discretion of the Engineer, and as may be indicated by the supply of materials on hand.

E. Excavation: If DEP determines that it is necessary to go to an additional depth or to an additional depth and width, carry the excavation to such additional depth and width as the Engineer may direct in writing. Refill such excavated space with either 2,500 psi concrete or compacted fill materials, as ordered. Where necessary, compact fill materials to avoid future settlement. Use fill materials meeting the requirements of backfill material stated in Part 2 of this specification, and compact to attain a minimum degree of compaction of ninety-five (95%) percent of the maximum dry density as determined by ASTM D1557. Place backfill in lifts not exceeding nine (9) inches in loose thickness.

F. Unauthorized Excavation: Wherever the excavation is carried beyond or below the lines and grades shown on the Contract Drawings or given by the Engineer, except as specified in Subsection 3.05.E - “Authorized Additional Excavation”, refill all such excavated space with such material and in such a manner as may be directed by the Engineer in order to insure the stability of the various structures. Areas excavated beneath all manholes, structures, pipelines or conduits without authority must be refilled by the Contractor at his or her own expense with 2,500 psi concrete or compacted fill material and properly compacted as ordered by the Engineer.

G. Explosives: Do not use explosives for any clearing, grubbing or excavation work.

H. Vehicles used to transport excavated materials to disposal sites must, when traveling, be watertight and of such a construction as to prevent spillage. All methods of transportation and disposal are subject to the approval of the Engineer.

I. The Contractor shall provide a final Survey Data Report for the site including the excavation area after all excavation Work has been completed. This report must include measurements of all final dimensions of the excavation area. The Contractor shall employ a tripod-supported auto-fire or auto-scan laser with built-in angle and distance measurements and software capabilities.

3.06 EXCAVATION OF BOULDERS IN OPEN CUT

A. The Contractor may elect to remove an entire boulder when partly extending into the trench. Boulders must be removed from the site of the Work immediately after being excavated and measurements taken by the Engineer. Excavated boulders will become the Contractor's property and must be properly disposed of at the Contractor's expense.

3.07 HAND AND/OR PNEUMATIC EXCAVATION

A. Prior to beginning Work, the area to be trenched/excavated must be thoroughly wetted, 24 hours in advance, to minimize dust to the greatest extent possible. Trenching/Excavation must be accomplished either by hand or with a pneumatic device such as an Air-Spade CGP System, as manufactured by Concept Engineering Group, Inc. Verona, PA, or approved equal. The Contractor shall provide a compressor unit for operating the pneumatic excavator rated at one hundred fifty standard cubic feet per minute (150 scfm) at ninety pounds per square foot gauge (90 psfg). All pneumatic excavation must be as minimal as possible in width and depth, thereby minimizing the impact on tree roots and other areas where the Engineer determines that conventional machine excavation may be detrimental. Different nozzles may be used on the air spade to expedite the Work or minimize the amount of airborne material. Depth will be as indicated on Contract Drawings or as directed by the Engineer. Depths greater than eighteen (18") inches will require removal of soil by hand shovel, or other appropriate means. Where a pneumatic device is used, care must be taken to avoid rocks being scattered and inadvertently damaging private or public property. In addition, operators must be equipped with adequate protective clothing and gear, in accordance with manufacturer's recommendations.

B. For Work on NYC Department of Parks and Recreation-owned Properties: All tree roots exposed by the pneumatic or hand excavation operation must be kept constantly moist with burlap covered with white plastic and checked a minimum of two (2) times a day, once in the morning and once in the afternoon, for a maximum of forty-eight (48) hours, until backfill is complete as directed by the Engineer. If directed, soaker hoses shall be installed to facilitate properly moist conditions. In cases where roots must be cut, the Contractor must receive written approval from the Engineer prior to cutting any roots. Roots must be cut cleanly with pruning shears, loppers, or pruning saws. All root cuts must be approved by the Engineer prior to backfilling and shall meet requirements outlined in the Section 01 56 39 – Temporary Tree and Plant Protection.

3.08 PAVEMENT EXCAVATION

A. The Contractor will be required to cut all asphaltic pavement; concrete pavement; asphaltic top course on concrete base pavement; and all other roadway pavements specified or ordered; as follows:

1. full-depth saw cuts of pavement along the initial opening limits of all trenches and excavations;

2. full-depth saw cuts of pavement along the edges of all trenches and excavations for cutbacks of trenches and excavations;

3. full-depth saw cuts of asphaltic top course along the edges of all trenches and excavations for cutbacks of asphaltic top course;

4. full-depth saw cuts of pavement across the widths of trenches, excavations and cutbacks;

5. A "full-depth saw cut" is defined as the cutting of pavement by the use of a dust controlling rotary blade concrete and pavement saw cutting machine. (Vermeer type cutting machines will not be permitted for use in order to make full-depth saw cuts.)

B. The Contractor will be required to full-depth saw cut all sidewalks, curbs, and walls along the limits of all trenches and excavations or as directed by the Engineer.

C. All saw cutting must be done with approved power tool equipment. Workmen shall wear safety clothing and eye protection while operating saw equipment and shall be thoroughly familiar in the safe operation of the equipment.

D. All pavements shall be initially opened as specified in Subsection 3.07.A. and Subsection 3.07.B above. Unless otherwise specified, the remainder of the pavements between cuts may be opened with hand-held "Jack" Hammers, Hoe-Rams, or Truck-Mounted Pavement Breakers. Hoe-Rams will be permitted to crack the pavements between longitudinal cuts just prior (same day) to the excavation (where surrounding pavement is to remain). This applies to all streets at all times. The area under construction must be kept as clean and neat as possible and no material shall restrict water flow in gutter areas.

E. In order to minimize future settlements, cuts in recently constructed pavements still under guarantee by the Contractor; in which subgrade material is removed along with the pavement excavated; must be backfilled to subgrade of pavement with clean sand or run-of-bank gravel, except where subsurface conditions preclude granular fill, as determined by the Engineer.

F. All pavement removal must be done in such a manner so as not to disturb the existing pavements outside the specified and ordered area of removal and restoration.

G. For the removal and restoration of brick or block pavements the edges of the pavement must be toothed or racked back.

3.09 SHEETING AND BRACING

A. The Contractor shall provide all labor, equipment, materials and incidental items and services necessary to perform sheeting and bracing as indicated on the Contract Drawings and specified herein.

B. All excavations must be excavated with vertical sides and properly sheeted and braced for the full depth of the excavations, unless otherwise shown on the Contract Drawings specified or ordered in writing by the Engineer. All excavation must be shored and braced in accordance with 29 CFR 1926 Subsection P requirements, NYCDOB regulations and in conformity with the requirements of Industrial Code Rule 23 - "Protection of Persons

Employed in Construction and Demolition Work" and 16NYCRR Part 753 of the Industrial Code - "Protection of Underground Facilities" of the State of New York, Department of Labor, Board of Standards and Appeals.

C. The equipment to be used and the method to be employed in starting the sheeting operation must be submitted for approval and must be approved in writing by the Engineer before the start of Work.

D. Exception: Excavation for structures or pipe lines five (5) feet in depth or less need not be sheeted and braced except where excavation is in close proximity to existing footings or conduits and where unsupported sides may be unstable.

E. Timber sheeting and bracing and other sheeting systems must be of sufficient dimensions and strength, and steel sheeting must be of sufficient type, size and weight, to support adequately the sides of the trenches and excavations and insure the safety of adjacent structures and must be installed in accordance with the approved sheeting details. The Contractor shall be solely responsible for the adequacy and sufficiency of all sheeting and bracing used.

F. Design and install sheeting and bracing in excavations for pipe lines so that at no time shall sheeting be braced or blocked against the sides of pipe or conduit. Do not drive sheeting for pipelines below the elevation of the bottom of the pipe. If it is necessary to drive the sheeting below that elevation in order to obtain a dry trench or satisfactory working conditions, cut off the sheeting and leave in place below the top of the pipe at no additional cost to the City.

1. Contractor shall design and provide additional and supplemental sheeting and bracing as needed to perform the excavation.

2. Adjust field locations of wales, rakers, struts and braces as required and approved by the Engineer to avoid interference with new Work and provide sufficient bearing. Block between wales and sheets with steel shims immediately after installing braces.

3. Struts must be wedged, posted and tied to form a stiff support. Rakers and struts to be preloaded shall be jacked to the loads shown on the Contract Drawings. Rakers and struts must be preloaded in the presence of the Engineer.

4. Provide web stiffeners, plates or angles as needed to prevent rotation, crimping or buckling of connections and points of bearing between structural steel members and/or jacks occasioned by eccentricities caused by field fabrication, ass embly or conditions.

5. Protect bracing members from damage by construction equipment and other causes. Repair any damage promptly and erect temporary barriers to secure area of damage, as required.

G. Unless otherwise specified, timber sheeting and bracing must be driven or placed ahead of the excavation in such a manner as to prevent the loss or slippage of ground in order to safeguard adjacent surface and subsurface structures. The sheeting will be driven to adequate depth below subgrade. As the Work progresses, any voids back of the sheeting will be filled and compacted in accordance with the Specifications and as directed by the Engineer.

H. Sloped sides will not be permitted, unless shown, specified or permitted in writing by the Engineer.

I. Where permitted or ordered in writing by the Engineer, slope the sides of the excavation to elevations approved by the Engineer and excavate below such elevations with vertical sides, properly sheeted and braced. Side slopes must be stable. Banks more than five (5) feet high must be shored and sloped to the angle of repose in accordance with current OSHA standards to furnish safe working conditions, to prevent shifting of material, to prevent damage to structures or other Work and to avoid delay to the Work, all in compliance with U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54). The minimum shoring, sheeting and bracing for trench excavations must meet the general trenching requirements of the applicable safety and health regulations. However, in no case will the sides of trench excavations for pipe or conduit be sloped to elevations lower than two feet above the top of the pipe or conduit.

J. The arrangement, construction, testing and maintenance of the lateral bracing system will be the responsibility of the Contractor.

K. The following methods of sheeting trenches are acceptable:

1. Vertical Wood Sheeting
2. Steel Soldier Beams with Horizontal Wood Lagging
3. Interlocking Steel Sheeting
4. Trench Boxes for trench depths up to twelve (12) feet
5. Steel Soldier Beams with Steel Plates continually supported
6. Steel Frames with Steel Plates for trench depths up to twelve (12) feet
7. Krings and Icon Type Sheeting Frames and Plates

L. The width of trenches, between inner faces of sheeting or rock, as the case may be, shall not exceed the width of the structure to be installed by more than three (3) feet. Where two (2) or more stages of sheeting are used, the width of trench shall not exceed the width of structure by three (3) feet at the lowest stage of sheeting to a point two (2) feet above the top of pipe or conduit.

M. The following criteria must be used in calculating the required sheeting, bracing and/or decking systems:

1. All compression members (struts) must be designed with a factor of safety of two (2.0). The factor of safety of two (2.0) must be a value above and beyond the allowable value for compressive stresses for steel as designated in the "Manual of Steel Construction" (AISC), and for wood as designated in the "National Design Specification for Stress-Grade Lumber and its Fastening". All other allowable stresses (not including compression members) may be increased by thirty-three and one-third (33-1/3) percent where sheeting and bracing is deemed a temporary structure.

2. A factor of safety must be used to determine the minimum embedment for sheeting as follows:

   a. Vertical Timber - 15%

   b. Soldier Beams - 20%

   c. Steel Sheeting - 30%

3. Embedment must be calculated in accordance with the procedures and standard minimum load diagrams specified herein. The maximum allowable embedment for vertical timber sheeting must not exceed three feet six inches (3'-6"). The minimum embedment must be two (2) feet.

4. The Contractor is advised that the maximum allowable bending stress (F_b) for all timber members must not exceed one thousand seven hundred fifty (1,750) pounds per square inch. If the Contractor elects to use a bending stress higher than F_b = 1,750-psi, written certification of bending stress test results must be submitted to the Engineer prior to use of such material in construction.

5. Where it is anticipated that heavier crane or equipment loads will fall within the influence line of the trench, design loads must be increased accordingly.

6. The Contractor shall compute and include in the Contractor’s submission of drawings and calculations the following:

   a. Maximum bending stress

   b. Maximum horizontal shear in wale

   c. Compression perpendicular to grain

   d. Maximum vertical shear stress

7. Unless otherwise specified in the Contract Documents or approved in writing by the Engineer, the minimum live load on decking shall be AASHTO HS20-44 or Contractor’s equipment or heaviest truck loading (i.e. concrete trucks) whichever is greater plus an impact factor of thirty- three (33%) percent.

8. Unless otherwise approved timber mats must extend a minimum of three (3) feet from sheeting line on either side of trench.

9. Unless otherwise approved a minimum one thousand (1,000) pounds per square foot surcharge load must be used for sheeting below decking.

10. Sheeting details must accurately depict actual field operations. The Contractor shall be restricted to a maximum five (5) feet deep pilot cut and all details must reflect this. Pilot cuts shall be made with equipment approved by the Engineer. Additional braces and wales may be required to install sheeting due to the five (5) feet maximum pilot cut restriction. The Contractor shall not assume that additional pilot cut depths will be allowed.

N. Sheeting can be used as forms for concrete Work. Whenever sheeting is used as formwork as specified or approved by the Engineer only timber sheeting will be permitted unless otherwise approved or specified in writing by the Engineer. When sheeting is used as formwork, an approved protection will be placed between the sheeting, bracing or soldier beams and the concrete. In addition, when sheeting is used as formwork for any structure or portion thereof, the thickness of that structure or portion of such structure shall be increased by three (3) inches beyond the original neat line of such structure or portion thereof. In no case will the sheeting, soldier beams or other bracing encroach upon the original neat line of the structure. In such instances when sheeting, soldier beams or other bracing is found to encroach upon the neat line of the structure, the Engineer shall direct the Contractor to remove such sheeting, soldier beams or other braces and redrive and/or replace the sheeting, soldier beams or other braces outside the neat line of the structure. All sheeting used as formwork must be removed.

O. In cases where sheeting and bracing will not adequately protect adjacent structures from damage and settlement, the Contractor shall employ other methods, such as underpinning and will hold the City harmless from all claims for damage arising from failure to adequately protect all structures. The Contractor will be presumed to have fully examined and inspected the buildings before estimating the costs and hazards involved.

P. Sheeting and bracing required to be provided by the Contract Drawings or the Specifications and subsequently allowed or ordered in writing by the Engineer to be omitted will be subject to suitable credit to the City. Measurement of sheeting and bracing limits subject to suitable credit will extend from the subgrade to within eighteen (18) inches of the ground surface in the case of vertical sides, regardless of stages; and will extend from the subgrade to twelve (12) inches above the junction of the vertical and sloping sides in the case of excavations with sloped sides above and vertical sides below. Sheeting and bracing indicated to be omitted on the Contract Drawings or in the Specifications will not be subject to credit.

Q. If, in the opinion of the Engineer, any of the approved temporary or permanent supporting structures are inadequate or unsuitable for the actual conditions in the field, the Engineer may direct the Contractor to strengthen the supporting structures at no additional cost to the City. The Contractor shall be responsible for the sufficiency of all temporary and permanent supporting structures whether or not directed by the Engineer to strengthen them.

3.10 SHEETING AND BRACING SHOP DRAWINGS

A. The Contractor will be required to submit Shop Drawings detailing the sheeting system whenever the depth of cut exceeds five (5) feet.

B. Before commencing any excavating operation, the Contractor shall have approved drawings from the Department of Environmental Protection for all types of sheeting and bracing systems, cofferdams, shoring, underpinning, bridging, decking and all other temporary or permanent supporting structures required.

C. The Contractor shall submit for approval five (5) copies of sheeting and bracing drawings, and other structures (i.e. decking, bridging) drawings that the Contractor proposes to use for the Work and allow a minimum of two (2) weeks to review same. This time requirement is to be considered in forming a Work schedule.

D. The Contractor shall have these drawings prepared by a Licensed Professional Engineer, currently registered in the State of New York. Such drawings shall be submitted together with design calculations, references, tables, and charts. Both drawings and design calculations must bear the imprint of the Licensed Professional Engineer's seal and signature.

E. In designing the sheeting stated above, the Contractor's Engineer shall take note of the standard minimum load diagram requirements for Watertight and Non-Watertight sheeting structures. (See DEP Sewer Design Standards.)

F. The following notes shall be required on all sheeting detail submissions:

1. If the actual surcharge is in excess of three hundred thirty (330) pounds per square foot the Contractor shall adequately reinforce the sheeting and bracing as required at no additional cost to the City.

2. Maximum pilot cut shall be five (5) feet.

G. The sheeting and bracing drawings must also include but not be limited to the following: the density of the soil, the internal angle of friction of the soil, the stress grade and type of lumber, the allowable steel stresses and the sequence of construction operation where required.

H. Shop Drawings of sheeting, bracing and other structures used by the Contractor shall be signed by and carry the seal of a Professional Engineer licensed in the State of New York. These drawings must be submitted together with proper design computations bearing the same seal and signature. Shop drawings will be on sheets twenty-seven (27) inches by forty (40) inches with a one-half (1/2) inch marginal space on three (3) sides and a two (2) inch marginal space for binding on the left side.

I. Shop Drawings must be numbered consecutively, accurately, and distinctly present the following:

1. All working and erection dimensions.

2. Arrangement and sectional views.

3. Necessary details, including complete information for making connections between Work under this Contract and work under other contracts.

4. Kinds of materials.

J. Each Shop Drawing shall be dated and contain:

1. The name of this project and this Contract number.

2. The description name of classified Contract item number or numbers under which it is, or they are required.

3. The locations or points at which the sheeting is to be installed in the Work.

K. All sheeting submissions must reflect the means and methods chosen by the Contractor and approved by the Engineer. Whenever steel sheeting systems (including trench boxes, frames and plates, etc.) are submitted which would render the crossing of Utilities (i.e. water mains and sewers) impossible the Contractor shall also submit for approval a system which can be utilized to permit such crossings (i.e. wood sheeting).

L. The submission of multiple sheeting systems must be kept to a minimum. Whenever the Contractor submits multiple systems for approval, the submission must be accompanied with a Location Plan Shop Drawing to indicate the exact location where these various systems are to be installed. Since the approval of multiple systems will delay the sheeting approval process the Contractor is requested to submit a schedule indicating the time frame that these systems are required. In addition, the Contractor will be required to install these multiple systems at the locations indicated on the submitted Location Plan. If the Contractor requests a change to the sheeting system at any particular location, the Contractor will be required to resubmit the sheeting drawing, for approval, even though the revised sheeting system may have been approved at another location within the project area. The Contractor is reminded that the approval time for any given sheeting system may require up to four (4) weeks.

3.11 REMOVAL OF SHEETING

A. All sheeting design and requirements must be in strict conformance with this section and all appropriate Addenda to the Specifications.

B. Unless otherwise specified in the plans or these specifications, the Contractor shall remove all sheeting and bracing throughout the project.

C. Obtain permission of the Engineer before the removal of any shoring, sheeting, or bracing. Such permission by the Engineer will not relieve the Contractor of responsibility for injury to structures or to other property or persons resulting from failure to leave such sheeting and bracing in place.

D. Where sheeting and bracing is removed, the removal must be done as the excavation is refilled in a manner to avoid the caving in of the bank or disturbance to adjacent areas or structures, except as otherwise shown on the Contract Drawings or directed. Carefully fill voids left by the withdrawal of the sheeting by ramming or otherwise as directed by the Engineer.

E. The sheeting must be removed in lifts during the backfilling operation to permit proper placement and compaction of material against the structure and the earth bank. This Work must be accomplished in conjunction with the removal of wales and braces. In no case will the lifts for sheeting exceed the specified or otherwise approved depth of compaction layer.

F. The Contractor shall submit to the Engineer, for approval, the Contractor's method for installation and removal of sheeting and the method for backfilling the trench. The submission must also specify if there are any location(s) where sheeting cannot be removed and detail the reasons why the sheeting cannot be removed. The submission must be signed by and carry the seal of a New York State Licensed Professional Engineer. These methods must be strictly adhered to.

G. Load from rakers, struts and corner braces must be released in a controlled fashion by cutting kickers and removing wedges and shims, as approved by the Engineer.

H. The Contractor is advised that the Contractor will be responsible for, and shall solely at the Contractor's own expense, repair, replace and/or relocate all City owned utilities that are damaged and/or disturbed due to the Contractor's removal of sheeting operation.

I. This section is not to be construed to relieve the Contractor of the Contractor's obligation under the Contract to maintain, protect and support (temporarily and permanently) all City owned utilities within the influence lines of the excavated trenches. The Contractor in accordance with the standards of the agencies having jurisdiction thereof must perform such maintenance, protection, and support.

J. The cost of maintenance, protection, and support (temporarily and permanently) of City owned utilities is included in the prices bid for all items for which there are bid prices.

K. If a soldier beam and lagging sheeting system is utilized then all parts of the system (i.e. soldier beams, bracing, wales and lagging) must be removed.

L. When the sheeting and bracing for the vertical sides of trench excavations is not required to be left in place, such sheeting and bracing will be removed, and backfilled and compacted to an elevation at least 1'-6" above the top of the pipe or conduit. Any exception to this requirement will be shown on the Contract Drawings.

M. No additional payment will be made for repairing, replacing and/or relocating City owned utilities that may be damaged and disturbed due to the Contractor's removal of sheeting operation, or for Work performed by the Contractor as directed in Subsection 3.09.I above.

3.12 SHEETING AND BRACING LEFT IN PLACE

A. Leave sheeting and bracing in place in excavations for structures other than pipe lines where shown on the Contract Drawings, specified or ordered in writing by the Engineer to be left in place.

B. When sheeting is to be left in place, all elements such as rangers and braces, of the sheeting used, must be left in place, except for such temporary braces that require removal in order to make way for the structure or pipe line being constructed. Where it is necessary to remove such temporary braces, the sheeting must be rebraced in a manner approved by the Engineer; however, in no case will the sheeting be braced against the side of the structure unless approved in writing by the Engineer. Where lagging and soldier beams are used, the soldier beams and all the rangers and braces must also be left in place. Where steel sheeting is used, the rangers and braces must also be left in place.

C. When sheeting is to be left in place, the Contractor shall cut sheeting at the elevations ordered in writing by the Engineer; however, in general such cutoffs must not be less than four (4) feet below the final grade. Timber sheeting must be cut off by sawing. Steel sheeting or soldier beams must be cut off by burning. Breaking off of sheeting will not be permitted. The Contractor shall remove from the trench and away from the Site of Work, to the Contractor's own place of disposal, all cut sheeting and soldier beams together with all rangers, lagging and braces above the ordered elevation of cut. Where the removal of rangers and braces above the ordered elevation of cut is determined by the Engineer to render the sheeting system unstable, rangers and braces must be placed prior to cutting at a level below the ordered elevation of cut and left in place.

1. In excavations with sloped sides above and vertical sides below, cut off sheeting at the top of the vertical sides of the excavation.

2. All sheeting and bracing in excavation for sewer pipe lines, including manholes and chambers, will be left in place except where otherwise shown on the Contract Drawings, specified or ordered in writing by the Engineer. Sheeting left in place must be cut off at the elevation shown on the Contract Drawings, or at least eighteen (18) inches below final grade. Bracing remaining in place will be driven up tight.

D. Where it is necessary to remove cross braces to make way for sewer pipe, manholes, and chambers, rebrace the sheeting in a manner approved by the Engineer, but in no case will sheeting be braced against the sides of pipe or structures, unless approved in writing by the Engineer.

E. Cut off timber sheeting by sawing, and steel sheeting or "soldier" beams by burning. Breaking off sheeting will not be permitted.

F. Do not remove sheeting and bracing not shown on the Contract Drawings or specified to be left in place without first obtaining a statement in writing from the Engineer that such sheeting may be removed.

G. No separate or additional payment will be made for sheeting and bracing that is specifically shown on the plans or specifically described in the specifications to be left in place in excavations, regardless of the type used nor for the removal from the excavation and the disposal away from the job Site of the cut sheeting, bracing and rangers. The cost thereof must be included in the prices bid for all Contract items of Work relating to sewers.

H. If sheeting is specifically shown on the plans or specifically described in the specification to be left in place in and excavations and the Contractor requests permission to remove the sheeting and bracing in place, and such procedures are approved in writing by the Engineer, an acceptable credit will accrue to DEP for the portion of the sheeting and bracing removed or omitted.

3.13 LINES AND GRADES

A. Excavate for sewers, drains, conduits, pipe lines, walls, foundations, footings, and other structures, including any excavating indicated on the Contract Drawings or necessary, to the lines and grades shown on the Contract Drawings, specified or required.

B. Cut pavements, curbs and sidewalks with non-impact tools or other equipment approved by the Engineer. Breaking of pavements, curbs and sidewalks by impact, such as with the use of a ball, is not permitted. When removing sections next to sections that are to remain, sawcut the full depth of the concrete and/or asphalt.

C. Do all trimming, grading and other incidental Work to the grades and slopes shown on the Contract Drawings, specified or required as approved by the Engineer. Perform all excavations of sufficient size for the proper execution and inspection of the Work. Keep excavation in good condition at all times and fill all voids which may endanger existing structures to the satisfaction of the Engineer.

3.14 SUBGRADE CONSOLIDATION

A. Consolidating Suitable Materials: Materials used in the bottom of excavation to replace boggy and other yielding or unsound materials, for providing solid and firm foundations for the structures to be built thereon, where approved in writing, may be either select fill or lean concrete.

3.15 FENCING, BRIDGING AND DECKING

A. All excavations or openings made under this Contract in any public street, park or place, or in any adjoining property, shall be immediately enclosed by a guard fence constructed in a neat and workmanlike manner in accordance with the requirements of Section 01 56 00 – Temporary Barriers and Enclosures. Where a tight board fence is specified, no guard fence will be required, provided there is no delay in the erection of the tight board fence.

B. Wherever the distance between available crossings over the excavation is, in the opinion of the Engineer, excessive, a temporary foot bridge with side rails to be constructed.

3.16 FROST PREVENTION

A. Protection must be provided against the penetration of frost into material below the bearing level during Work in the winter months. This protection must consist of a temporary blanket of straw or salt hay covered with a plastic membrane or other approved means.

3.17 SEGREGATION, STORAGE AND DISPOSAL OF MATERIALS

A. Materials delivered to the site must be stored in a manner to prevent contamination and segregation.

B. Imported fill materials of all types shall meet the requirements in subpart 2.01 A.1. of this Section unless approved in writing by the Engineer.

C. All unsuitable material which may be excavated by the Contractor during his operations must be segregated from suitable excavated material and may be reused offsite under a pre-determined NYSDEC BUD, site-specific BUD or other applicable out of state agency's site-specific BUD or disposed offsite. Soil that shows evidence of characteristics attributable to hazardous material must be characterized by sampling and analysis in accordance with the requirements of Section 02 24 20 – Soil Sampling and Analysis. Addition of excavated soil to a stockpile that has already been sampled for purposes of characterization is prohibited. Removal and disposal of regulated hazardous waste and non-hazardous waste must be as described in the approved Soil Excavation, Transport and Disposal Plan in subpart 1.06 C.

D. All stockpiles of excavated soil must be covered with an impermeable, woven polyethylene fabric. The fabric must be a composite structure of woven polyethylene fabric and 1.5 mils of polyethylene film laminated on both sides to form a monolithic sheet. The fabric must be inert to biological degradation and naturally encountered chemicals, alkalines, and acids. Its permeability coefficient must be less than 10-3 cm/sec. The terminal edges of the fabric panels must be secured to prevent uplift by wind. Stockpiles must be covered during non-working hours and during periods of no construction activity.

E. The Contractor shall make arrangements for and properly transport and re-use the soil offsite under a pre-determined NYSDEC BUD, site-specific BUD or other applicable out of state agency's site-specific BUD or dispose of all surplus material.

3.18 BACKFILLING

A. Backfill all excavations to the original surface of the ground or to such other grades as may be shown or required. For areas to be covered by lawn mix, leave or stop backfill twelve (12) inches below the finished grade or as otherwise required to provide adequate depth of lawn mix to satisfy the requirements of Section 32 92 19 – Seeding. Obtain approval for the time elapsing before backfilling against recently constructed masonry structures. Remove from all backfill, and from the space being backfilled, any compressible,

putrescible, or destructible rubbish and refuse and all lumber and braces before backfilling is started. Leave sheeting and bracing in place or remove as the Work progresses. Dispose of the rubbish and refuse in accordance with 01 74 20 – Construction Waste Management.

B. 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 provided 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.

C. The Contractor's operations shall conform to the requirements of Section 01 57 13 - Temporary Erosion and Sediment Control.

D. No material will be placed until satisfactory test reports for material type and compaction requirements have been approved by the Engineer.

E. Warning tape/ribbon must be placed and/or restored as required when backfilling new and existing utility lines.

3.19 TRENCH BACKFILL

A. Backfill trenches from one (1) foot over the top of the pipe, 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. Backfill trenches as soon as, in the opinion of the Engineer, it can be done without injury to the concrete or pipe lines.

B. Provide suitable backfill 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 nine (9) inches in loose thickness and thoroughly compact in place using suitable mechanical or pneumatic equipment. Compact backfill to not less than ninety (90%) percent of the maximum dry density as determined by ASTM D1557.

D. Backfill trenches in such a way as to prevent dropping material directly on top of any 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.

E. Break up lumps and distribute any stones, pieces of crushed rock or lumps which cannot readily be broken up, throughout the mass so that all interstices are solidly filled with fine material.

F. Retain backfill in trenches by temporary bulkheads only and remove them as the backfilling progresses. Do not make bulkheads of stone.

G. Do not cover sewers, drains, basin connections, ends of sewers and branches until the Engineer orders or gives permission to backfill.

3.20 STRUCTURE BACKFILL

A. Backfill excavations as soon as, in the opinion of the Engineer, it can be done without injury to the concrete or structures.

B. Use suitable backfill underneath all structures, and adjacent to structures where pipes, connections, electrical ducts and structural foundations are to be located within this fill. Use select fill beneath all pavements, walkways, and railroad tracks, and extend to the bottom of pavement base course or ballast.

1. Place backfill in uniform layers not greater than eight (8) inches in loose thickness and thoroughly compact in place with suitable approved mechanical or pneumatic equipment.

2. Compact backfill to not less than ninety-five (95) percent of the maximum dry density as determined by ASTM D1557.

C. Use of common granular fill, such as clean sand or run- of-bank gravel, adjacent to structures in all areas not specified above, unless otherwise shown or specified. Select fill may be used in place of common granular fill at no additional cost.

1. Extend such backfill from the bottom of the excavation or top of bedding to the underside of the lawn mix for seeded, sodded or hydroseeded areas, the top of previously existing ground surface or to such other grades as may be shown or required.

2. Place backfill in uniform layers not greater than eight (8) inches in loose thickness and thoroughly compact in place with suitable equipment, as specified above.

3. Compact backfill to not less than ninety (90%) percent of the maximum dry density as determined by ASTM D1557.

D. When sheeting is withdrawn, solidly fill all cavities in or adjoining the trench or other excavation. When sheeting is left in place, solidly fill all cavities behind such sheeting.

3.21 COMPACTION EQUIPMENT

A. Perform all compaction with suitable approved equipment and methods.

B. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use handheld pneumatic tampers elsewhere for compaction of cohesive fill material.

C. 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.

D. Do not use heavy compaction equipment over pipelines or other structures, unless the depth of fill is sufficient to adequately distribute the load.

3.22 FINISH GRADING

A. Perform finish grading in accordance with the completed contour elevations and grades shown on the Contract Drawings and blend into conformation with remaining natural ground surfaces.

1. Leave all finished grading surfaces smooth and firm to drain. Areas shall be finished to the degree obtainable by either blade or scraper operations and suitable for application of topsoil/Engineered Soil.

2. Bring finish grades to elevations within plus or minus 0.10 foot of elevations or contours shown.

3. Areas which are anticipated to be undisturbed for a period of more than thirty (30) days shall receive temporary seeding of rye grass at a rate of three bushels per acre, weather and season permitting. This seeding shall be repeated as necessary to maintain a continuing ground cover.

B. Grade outside of building or structure lines in a manner to prevent accumulation of water within the area. Where necessary or where shown, extend finish grading to ensure that water will be carried to drainage ditches, and the site area left smooth and free from depressions holding water.

3.23 FIELD QUALITY CONTROL

A. Provide sampling, testing, and laboratory methods in accordance with ASTM D1556 or other method as determined by the Engineer for backfill. Subject all backfill to these tests to the satisfaction of the Engineer. These tests will be the basis for acceptance or rejection by the Engineer of the compaction. Failure to achieve the specified densities shall require the Contractor to recompact or remove the material as required.

B. Correction of Work:

1. 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. The Contractor shall, if necessary, increase the compactive effort by increasing the number of passes, using heavier or more suitable compaction equipment, or by reducing the lift thickness. The Contractor shall adjust the moisture content of the soil to bring it to the optimum range by drying or adding water, as required.

2. 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.

3.24 METHOD OF DEPOSITING ALL BACKFILL

A. Prior to backfilling, the subgrade must be proof-rolled to the required density with compaction equipment approved by the Engineer.

B. Passes must be overlapped a minimum of six (6) inches and not fewer than three (3) passes to be completed.

C. The use of backhoe buckets for the compaction of backfill material in all trenches and excavations will not be permitted.

D. All backfill must be carefully deposited and spread by approved methods.

E. Backfill must proceed simultaneously with the withdrawal of sheeting. Withdrawal of sheeting below levels previously backfilled and compacted is prohibited.

F. Each layer must be compacted to a minimum of ninety-five (95%) percent of Standard Proctor Maximum Dry Density (as determined by AASHTO T-99 Test Method), before a successive layer is deposited.

G. The Contractor shall retain the services of a testing laboratory, in accordance with Section 02 24 20 – Soil Sampling and Analysis**,** to make all compaction tests of backfill materials used and placed. All compaction tests must be witnessed and verified by the Engineer.

H. The Contractor shall furnish to the Engineer, copies of in-process compaction reports certified by an Independent Testing Laboratory. These certified compaction reports must be submitted as directed by the Engineer.

I. Compaction to a minimum of ninety-five (95%) percent of Standard Proctor Maximum Dry Density shall be attained by the use of impact rammers, plate or small drum vibrators, or pneumatic button head compaction equipment. The equipment must be capable of exerting a pressure equivalent to two hundred fifty (250) to three hundred (300) pounds per inch width of compression roll, or an equivalent pressure if other than smooth wheel or pneumatic tired rollers are permitted. In areas inaccessible to power rolling or adjacent to construction that may be damaged, other types of approved compaction equipment may be used.

J. Hand tamping is not permitted except in the immediate area of underground facilities. The backfill within the immediate area of underground facilities must be deposited progressively in layers not exceeding six (6) inches in depth on all sides of the underground facilities, wetted (except where clay) in lifts of six (6) inches and lightly hand tamped with as many strokes as required to achieve ninety-five (95%) percent of Standard Proctor Maximum Dry Density. Where no specific written information is available to the Engineer, the definition of the immediate area will be the area within eighteen (18) inches around all underground facilities.

K. The Contractor shall be responsible for the proper compaction of all backfill in accordance with the Specifications. The Contractor shall also be responsible for determining and maintaining the proper moisture content of the backfill material at all times during the compaction process.

L. The Contractor shall backfill with material that has the optimum moisture content, as result of Proctor Analyses, so as to provide for the proper compaction of that material. In order to obtain the optimum moisture content, water shall be added, as required, and shall be thoroughly incorporated into the soil. Manipulation must be provided whenever necessary

to attain uniform moisture distribution to the soil. When the moisture content of a layer about to be compacted exceeds the required optimum moisture content, compaction will be deferred until the required optimum moisture content is achieved or, if directed by the Engineer, a more suitable material shall be substituted. No separate or additional payment will be made for any costs associated with the achievement of optimum moisture content, including any additional excavation due to the removal of any layer not meeting the specified requirements and for the replacement of any layers with suitable material. Costs are deemed included in the prices bid for all items of Work.

M. In-place soil density tests will be required to ensure that the soil compaction requirements of the Specifications are met. In-place soil density tests must be taken for each and every layer of backfill placed, at a maximum of one hundred (100) foot intervals along the length of each layer. However, the location of the tests will vary horizontally along each successive layer, such that no two (2) tests are conducted at the same station location as any previous layers. The number and locations of in-place soil density tests will be as directed by the Engineer.

N. Up to each one thousand (1,000) cubic yards of each type of backfill soil utilized, for which in-place soil density tests are to be performed, shall undergo a minimum of one (1) Proctor analysis in order to determine the maximum dry density and optimum moisture content of the soil material to be tested. Due to varying soil conditions, additional Proctor analyses may be required by the Engineer. The number and locations of all samples to undergo Proctor analysis shall be as directed by the Engineer.

O. Proctor analyses and in-place soil density tests shall be performed in accordance with Subsection 3.26 - Soil Density Testing.

P. No separate or additional payment is made for the depositing, compacting and sampling of backfill or for the services of the approved testing laboratory, the costs thereof, is be deemed included in the prices bid for all items of Work.

Q. Where sheeting has been used for the excavation, it will be pulled when the excavation has been filled or backfilled to the maximum unsupported depth allowed by New York State Department of Labor Industrial Code Rule 23 and Title 29 Code of Federal Regulations Part 1926, Safety and Health Regulations for Construction. Where a difference exists between regulations, the more stringent requirement will apply.

R. Select granular fill material and approved backfill material must not be used to fill voids in the subgrade of the excavations for proposed sewer conduits and associated structures unless otherwise specified on the plans or in the Contract Documents, or as ordered in writing by the Engineer.

3.25 SOIL DENSITY TESTING

A. This section describes the performance of Proctor analyses of designated soils and the testing of designated soils for in-place density, to ensure that soil compaction requirements for the project are met. The Contractor shall retain the services of an independent Soils Testing Laboratory, subject to the prequalification requirements specified, to perform the Work under this section.

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B. Scope of Work - Under this section, the Contractor and approved Laboratory shall furnish all labor, materials, plant, equipment, insurance, and necessary incidentals required to: obtain soil samples from the site or other locations, transport to Laboratory, perform Proctor analyses of soil samples and submit written documentation of results; perform in-place soil density tests and submit written documentation of results; and perform all Work incidental thereto, all in accordance with the Specifications and as directed by the Engineer.

1. Proctor Analysis of Soil Samples - Soils for which in-place density tests are to be performed shall undergo a Proctor analysis in order to determine the maximum dry density and optimum moisture content of the soil material to be tested. Soils designated for Proctor analysis may include existing subgrade materials as well as proposed fill material, as directed by the Engineer. The number and locations of soil samples to undergo Proctor analyses will be specified and directed by the Engineer.

   Each soil sample designated for Proctor analysis must be recovered from the site or other location (stockpile, etc.) and transported to the Laboratory, in a manner acceptable to the Laboratory and the Engineer.

   The maximum dry density and the optimum moisture content of each soil sample will be determined by the Standard Proctor Test in accordance with AASHTO T-99 (ASTM D698). If, in the opinion of the Laboratory, a soil sample is too granular to achieve realistic maximum dry density and optimum moisture content readings by the Standard Proctor Test method, other appropriate test methods (Vibratory Table, etc.) may be substituted, subject to the approval of the Engineer.

   Written documentation on Laboratory stationery of the results of each Proctor analysis must be furnished to the Engineer, such documentation to include the following:

   a. Date Sample was Tested.
   b. Location and Date Sample was Obtained.
   c. Brief Description of Sample (Soil Type, Color, Consistency, etc.) or other identification.
   d. Maximum Dry Density (pounds per cubic foot).
   e. Optimum Moisture Content (percent).
   f. Test Method (If other than Standard Proctor Test).
   g. Signature and Seal of Qualified Laboratory Representative.

   Distribution of copies of Proctor analysis results will be as directed by the Engineer.

2. In-Place Soil Density Tests - In-place soil density tests will be required to ensure that soil compaction requirements for the project are met. In-place soil density tests and results must be performed and completed on site by the approved testing laboratory.

Test locations may include: existing subgrade material upon which fill material is to be placed, or upon which sewer conduits, water main pipes, catch basins, basin connection pipes or other structures are to be constructed; compacted fill material for pavement construction or for backfill of sewer conduits, water main pipes, catch basins, basin connection pipes or other structures; and other locations as directed by the Engineer. The number and locations of in-place soil density tests will be specified and directed by the Engineer.

The Contractor's attention is directed to the fact that it will be necessary in some cases to excavate through temporary pavements in order to test the compaction of backfill over sewer conduits, water main pipes, etc., and upon completion of the test, backfill and place new temporary pavement as necessary. No separate or additional payment will be made for such excavation, backfill or replacement of temporary pavement. All costs are deemed included in the prices bid for all items of Work.

The preferred test method for determining the in-place dry density and moisture content of the soil is the Sand Cone Test, in accordance with AASHTO T-191, T-205. Other approved types of density tests (nuclear, etc.) are permitted, provided that density values corresponding to those obtained by the Sand Cone Test method are established to the satisfaction of the Engineer. Such alternate density test methods must be checked at least once every fifty (50) tests against the Sand Cone Test method, as directed by the Engineer, to minimize equipment calibration errors. No separate or additional payment will be made for additional density tests taken solely for calibration purposes. All costs are deemed included in the prices bid for all items of Work.

After the in-place dry density of the soil is determined, the Degree of Compaction will be computed by the following formula:

$$\text{Degree of Compaction (\%)} = \frac{\text{In-Place Dry Density (lbs./cu. ft.)}}{\text{Maximum Dry Density (lbs./cu. ft.)}} \times 100$$

Written documentation on Laboratory stationery of the results of each in-place soil density test must be furnished to the Engineer, and such documentation must include the following:

a. Date of Field Test.
b. Location of Field Test.
c. Brief Description of Tested Soil (Soil Type, Color, Consistency, etc.) or other identification.
d. In-Place Dry Density (pounds per cubic foot).
e. In-Place Moisture Content (percent).
f. Density Test Method (If other than Sand Cone Test).
g. Maximum Dry Density (pounds per cubic foot) from corresponding Proctor analysis of same soil type.

h. Degree of Compaction (percent).

i. Signature and Seal of Qualified Laboratory Representative.

Distribution of copies of Density Test results shall be as directed by the Engineer.

C. Evaluation of Soil Test Results - All natural earth subgrade, fill and backfill material under this Contract shall be compacted to a minimum of ninety-five (95%) percent of Standard Proctor Maximum Dry Density.

The Degree of Compaction, as determined above, will be used for control purposes in determining compliance with project compaction requirements. However, it will be the responsibility of the Engineer to evaluate the results of the soil tests performed and determine the acceptability of subgrade preparation and fill construction.

D. Method of Payment - The cost of all labor, materials, plant, equipment, insurance and necessary incidentals required to perform all Proctor Analyses including the obtaining of soil samples, transportation of samples to the Laboratory, providing of written documentation of all results, andperforming all Work incidental thereto, all in accordance with the Specifications and as directed by the Engineer, is deemed included in the prices bid for all Contract items of Work. No separate or additional payment will be made for any costs associated with the performing of all Proctor Analyses of soil samples.

The cost of all labor, materials, plant, equipment, insurance and necessary incidentals required to perform all In-Place Soil Density Tests including the providing of written documentation of all results, and performing all Work incidental thereto, all in accordance with the Specifications and as directed by the Engineer, is deemed included in the prices bid for all Contract items of Work. No separate or additional payment will be made for any costs associated with the performing of all In-Place Soil Density Tests.

3.26 BACKFILLING AROUND SHEETING

A. When sheeting is withdrawn all cavities remaining in or adjoining the trench and excavation must be filled and meet all the requirements of Part 2 and Part 3 of this Specification. When sheeting is left in place all cavities behind such sheeting must be filled as directed and in such a manner so as to ensure compliance with all the requirements of Part 2 and Part 3 of this Specification.

3.27 DEFICIENCY OF BACKFILL MATERIAL

A. Unless otherwise shown on or specified in the Contract Documents, the Contractor shall backfill and compact all excavations to the underside of the pavement. Where deficiency of acceptable backfill material occurs, the excavations must be backfilled with the acceptable backfill materials as specified in Part 2 of this Specification.

B. The cost for all labor, materials, equipment and insurance necessary and required to place, compact, sample and test provided acceptable backfill material is deemed included in the prices bid for all Contract items of Work. No separate or additional payment will be made for this Work.

3.28 REMOVAL OF SURPLUS MATERIAL

A. As the excavation is backfilled, the Contractor shall remove all surplus material, and regrade and leave free, clear and in good order all pavement and sidewalks adjacent to the completed Work and within fifty (50) feet of the end of the completed Work. During the progress of and until the final acceptance of the Work, the Contractor shall maintain in good and safe condition the surface of pavements and sidewalks over and adjoining all the excavations, and promptly fill in depressions over and adjoining the excavations caused by the settlement of the backfill.

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ATTACHMENTS A and B, SHOWING THE MINIMUM NORMAL LOAD DIAGRAM REQUIREMENTS OF DEP FOR SHEETING DESIGN DURING EXCAVATION ARE GIVEN IN THE FOLLOWING PAGES (ALSO SEE ARTICLE 1.07)

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NO TEXT ON THIS PAGE

Attachment A

STANDARD FOR MINIMUM LOAD DIAGRAM FOR NON-WATERTIGHT SHEETING DESIGN

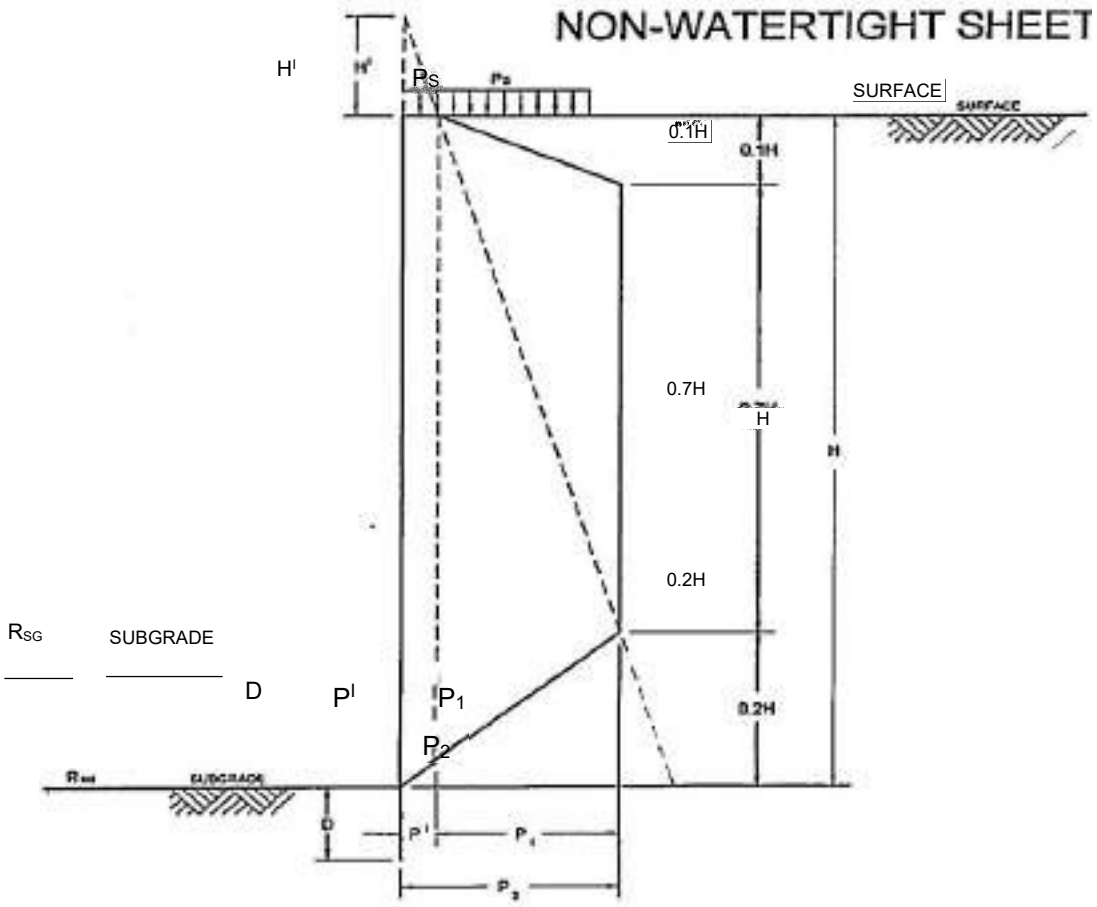
DESIGN CRITERIA:

γ = UNIT WEIGHT OF SOIL
γw = UNIT WEIGHT OF WATER
γs = UNIT WEIGHT OF SUBMERGED SOIL
θ = ANGLE OF INTERNAL FRICTION OF SOIL
K_{ra} = $\frac{(1 - \text{SIN } \theta)}{(1 + \text{SIN } \theta)}$ FOR ACTIVE EARTH PRESSURE
K_{rp} = $\frac{(1 + \text{SIN } \theta)}{(1 - \text{SIN } \theta)}$ FOR PASSIVE EARTH PRESSURE
H^I = 3 FEET MINIMUM
P_S = γ x H^I = SURCHARGE – MIN. 300 PSF
P^I = K_{ra} x P_S
P_1 = $(0.8K_{ra})$ x γ x H
P_2 = $P^I + P_1$

$$D = \sqrt{\frac{2R_{SG}}{\gamma (K_{rp} - K_{ra})}}$$

NOTES:

(1) THIS CRITERIA IS FOR BRACED SHEETING ONLY



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NO TEXT ON THIS PAGE

Attachment B

STANDARD FOR MINIMUM LOAD DIAGRAM FOR WATERTIGHT SHEETING DESIGN

DESIGN CRITERIA:

γ = UNIT WEIGHT OF SOIL

γw = UNIT WEIGHT OF WATER

γs = UNIT WEIGHT OF SUBMERGED SOIL

θ = ANGLE OF INTERNAL FRICTION OF SOIL

$K_{ra} = \frac{(1 - \text{SIN } \theta)}{(1 + \text{SIN } \theta)}$ FOR ACTIVE EARTH PRESSURE

$K_{rp} = \frac{(1 + \text{SIN } \theta)}{(1 - \text{SIN } \theta)}$ FOR PASSIVE EARTH PRESSURE

H^I = 3 FEET MINIMUM

$P_S = \gamma \times H^I$ = SURCHARGE – MIN. 300 PSF

$P^I = K_{ra} \times P_S$

$P_1 = P^I + (0.8K_{ra}) \times (\gamma H_1 + \gamma s H_2)$

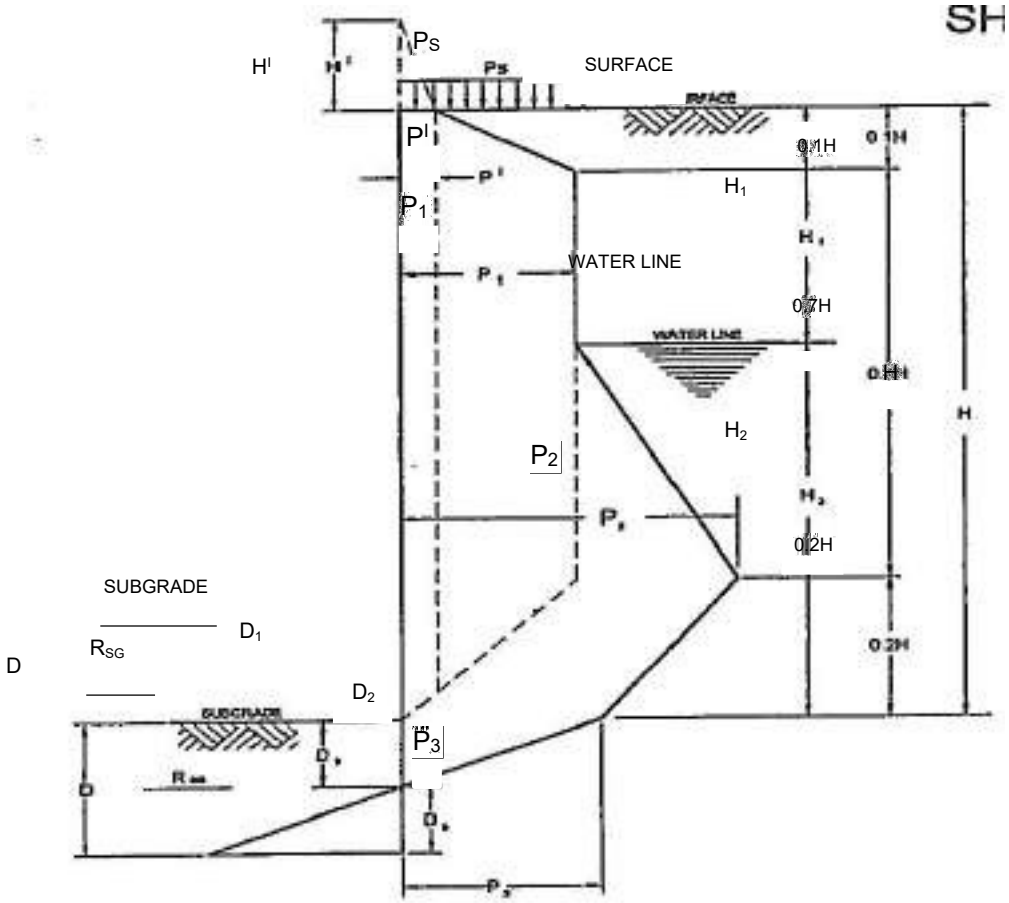
$P_2 = P_1 + \gamma w (H_2 - 0.2H)$

$P_3 = \gamma w \times H_2$

$D_1 = \frac{P_3}{\gamma_s (K_{rp} - K_{ra})}$

$D_0 = \sqrt{\frac{2R_{SG}}{\gamma_s (K_{rp} - K_{ra})}}$

$D = D_1 + D_0$



NOTES:

(1) THIS CRITERIA IS FOR BRACED SHEETING ONLY

END OF SECTION

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SECTION 31 31 19.13
CHEMICAL VEGETATION CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall apply herbicide to persistent weeds and weedy growth in accordance with the plans and Specifications and as directed by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

1.03 PAYMENT

A. The price bid for HERBICIDE APPLICATION shall be unit price per SQUARE FEET properly sprayed/wiped, treated by an appropriate herbicide, as accepted by the Engineer. The Contractor shall submit a daily record indicating the dimensions and a graphic representation of all completed areas; verifying these quantities with the Engineer prior to beginning work and again at the end of each working day.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE

A. Herbicides shall be applied by a Certified Applicator in accordance with the product label and any other Federal or State rules and regulations. The applicator and other personnel present on the site during herbicide application shall be outfitted with proper protective gear and clothing as indicated by the New York State Department of Environmental Conservation (NYSDEC) and/or the herbicide manufacturer. All spray crews shall consist of two (2) persons. At least one (1) person on each crew engaged in the application of herbicides must be certified by the NYSDEC as a Commercial Pesticide Applicator licensed in the appropriate category: Category 3A for Ornamentals, Shade Trees, and Turf; Category 5A for Aquatic Vegetation Control; Category 6A for Rights-of-Way Vegetation Control.

B. The Contractor shall be responsible for obtaining all the permits necessary to conduct the herbicide application(s).

C. The Contractor shall comply with all provisions of the Neighborhood Notification Law (Local Law 36) including but not limited to the following: 1) written notification of adjacent property owners, 2) signage and applicable application dates at all potential points of public access, including but not limited to major points of access as directed by the Engineer, and 3) the Engineer may require additional measures as deemed necessary to provide ample notification and to prevent the public from entering the treatment area during the potentially harmful period of exposure.

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CHEMICAL VEGETATION CONTROL

1.06 SUBMITTALS

A. The Contractor shall submit the following prior to each application:

1. At least three (3) weeks prior to the start of work, submit a Work Plan describing the intended operations, start date, scheduling, chemical treatments, and personnel for work within designated herbicide application areas.

2. The product(s) intended for use and the associated Material Safety Data Sheets (MSDS).

3. The proposed application rate and a written calibration process for the application of the herbicide.

4. Documentation of the Applicator's license(s) for the staff performing the Work.
5. A copy of all applicable permits.

B. The Contractor shall keep daily records of all herbicide application work including the licensed applicator(s) name, certification number, date, location of work, tank mix data, the amount of restricted herbicides applied (if any), USEPA registration number (as applicable), rate of application, method of application, target plant(s), and weather conditions. These records shall be shown to the Engineer at the end of each day's application. At the completion of each week of application work, a copy of these records shall be signed by the Applicator and submitted to the Engineer.

PART 2 PRODUCTS

2.02 The Work will eradicate invasive, non-native plants in upland and wetland areas. When applying herbicide via foliar spray, a mix of 2% Clearcast + 1% Vastlan + 0.5% MSO (or other non-ionic surfactant) in water will be used for eradication of all plants except Oriental Bittersweet. When applying herbicide via the wipe/injection method, Imazapyr, Imidazolinone (Arsenal) herbicide (manufactured by BASF Company), or approved equal, will be used for eradication of all plants except Oriental Bittersweet. Oriental Bittersweet will be treated with Garlon 4, manufactured by Dow Chemical, or approved equal. The use of Glyphosate (Round-Up) is **not** permitted. All chemicals shall be applied using backpack and hand-held sprayers, individual stem wipe applications, or direct injection. Herbicide application to open water/wetlands and broadcast spraying is prohibited. The Contractor shall furnish equipment suitable for the methods and procedures specified herein. The type of equipment shall be approved by the Engineer prior to the application of herbicide. The Contractor shall supply equipment that has been tested for calibration (rate of application) and be clean, sound, and free of leakage.

2.03 The contractor shall provide and have available on site a written Health and Safety Plan including:

1. Phone numbers for poison control.

2. Phone number and map to the nearest accessible local hospitals with emergency room facilities.

PART 3 EXECUTION

3.01 EMERGENCY PRECAUTIONS AND EQUIPMENT

A. The contractor shall provide and have available on site the following:

1. Written Health and Safety Plan.

2. First-aid kits including, at a minimum:

a. A portable eye-wash kit or eyewash bottles with buffered isotonic eyewash.
b. At least three gallons potable water (additional required for wash-up at the completion of work day).
c. Hand or body soap.
d. Paper or other disposable towels.

3. The Contractor shall also provide equipment for emergency spill response including shovels, heavy-duty plastic garbage bags, adequate absorbing material, neutralizers and a stiff broom.

3.02 INSTALLATION

A. Prior to the start of each treatment, the Contractor shall mark the limits of the work with surveyor's flagging tape or other suitable means. The Contractor shall notify Project Manager or his/her designated representative and request approval of treatment area at least five (5) days in advance of the proposed treatment. Final determination of the exact limits of the area to be treated with herbicide shall be as approved by the Engineer.

B. Prior to the start of Work, the Contractor shall carefully protect against damage all existing trees, plants and other features to remain. The Contractor shall be liable for any damage to such trees, plants, park features, and other property caused by invasives removal operations and all damaged property shall be replaced or restored to its original condition to the satisfaction of the Project Manager or his/her designated representative.

C. Before application begins, the Contractor and Applicator shall thoroughly survey the site and its surrounding area and carefully note all environmental and human factors which may be adversely affected by the intended herbicide application. These factors may include but are not limited to: illegal entry into the work area by people and pets; proximity to bodies of water and drainage ditches; crops grown for human consumption; existing valuable plants including large trees and roots both on and off the site and slopes with the potential for erosion problems. Potential environmental problems should be brought to the attention of the Project Manager or his/her designated representative. The Project Manager may

suggest an alternative application strategy or eliminate the application in sensitive areas. Any off-target damage to the environment shall be the responsibility of the Contractor and applicator.

D. All invasive removal work shall comply with applicable Federal, State and Local laws and regulations with regard to herbicide use, including the requirements of NYSDEC and NYC Local Law 36 and with regard to warning signs and neighborhood notification.

E. All herbicide application shall be performed with a representative from Engineer present to oversee application and removals.

F. All equipment will operate at the lowest feasible pressure and use spray nozzles which maximize droplet size to reduce the possibility of drift and off-target damage. A nozzle shield may also be required by the Project Manager or his/her designated representative when target plants exist amongst desirable plants.

G. The applicator and all workers within the target area shall wear proper safety equipment during the 24 hours following application. The Contractor shall make sure that no person enters the target area without wearing proper safety equipment within 24 hours of application.

H. Should a major spill of herbicide occur, the Contractor shall immediately contact the NYSDEC Bureau of Pesticides, the Project Manager or his/her designated representative and take all actions to neutralize damage to the environment.

I. No herbicide may be disposed of on or off the work site except with strict compliance of the manufacturer's label and NYSDEC regulations. The contractor shall remove and properly dispose of all contaminated containers, gloves, protective gear and the like. The applicator may not clean out any equipment on or near the worksite. All herbicides and application equipment shall be kept safe and securely locked during the period of work to prevent injury to unauthorized persons.

J. The NYSDEC Commercial Certified Pesticide Applicator(s) is (are) solely responsible for all matters of safety, efficacy, notification, reporting and compliance with all applicable laws and regulations.

K. The Contractor shall spray Arsenal or Garlon 4 herbicide, or approved equal, onto specified weedy growth only, as directed by the Engineer, between June 1 and September 30, unless otherwise directed.

L. The Applicator shall spray to wet--not to the point of runoff. Care must be taken to properly calibrate the tank nozzle to direct herbicide spray only onto the undesirable plants and obtain complete coverage of leaves and stems. Avoid spray drift onto desirable plants and minimize spray contact with soil. It is recommended to spray when plants are not under water stress. Only flat pan nozzles shall be used when using a spray applicator.

Marking dyes shall be added to the herbicide to prevent the accidental treatment of desirable plant material.

M. In areas where invasive plants are tightly intermixed with native plants, the applicator shall use the individual wipe or injection method to prevent the accidental treatment of desirable plant material. Marking dyes shall be added to the herbicide to prevent the accidental treatment of desirable plant material.

N. Apply herbicide on a warm sunny day (75 degrees to 90 degrees preferred). Do not spray if wind speed exceeds 5 mph or if weather conditions would decrease the effectiveness of the herbicide or increase the intended target area. Do not apply or allow herbicide spray into surrounding waterbodies. Do not exceed the rates indicated on product labels.

O. A non-ionic surfactant that is labeled for use with herbicides shall be added to the herbicide to help penetrate targeted plants for increased control. Surfactant must contain 50% or more active ingredient.

P. When using water from on-site hydrants, remove all suspended particles that may reduce the effectiveness of the herbicide prior to adding the water to the mixing tank.

Q. All treated areas shall be temporarily posted with signs indicating that the area has been treated with herbicide. Signs shall be clearly posted in areas where the public may come into contact with the plant material.

R. The Contractor shall return to the site after fourteen (14) calendar days and remove any dead vegetation that may interfere with planting of new material. If subsequent applications are deemed necessary, a minimum of twenty-one (21) calendar days is required from the previous application date. A minimum of thirty (30) calendar days after the last herbicide application is required before installing any new plant material. Planting may proceed when the site is deemed acceptable to the Engineer.

S. The plant species to be eradicated shall primarily include, but not be limited to, the following and shall include additional species at the direction of the Engineer:

1. Bamboo spp.
2. Black Locust (Robinia psuedoacacia)
3. Burning Bush (Euonymus alatus)
4. Common Ragweed (Ambrosia artemisifolia)
5. Common Reed (Phragmites australis)
6. English Ivy (Hedera helix)
7. Giant Hogweed (Heracleum mantegazzianum)

8. Giant Ragweed (Ambrosia trifida)
9. Japanese Honeysuckle (Lonicera japonica)
10. Japanese Knotweed (Polygonum cuspidatum)
11. Japanese Stiltgrass (Microstegium vimineum)
12. Mile-A-Minute Vine (Polygonum perfoliatum)
13. Mugwort (Artemisia vulgaris)
14. Mutiflora Rose (Rosa mutiflora)
15. Oriental Bittersweet (Celastrus orbiculatus)
16. Porcelain Berry (Ampelopsis brevipedunculata)
17. Purple Loosestrife (Lythrum salacaria)
18. Russian Olive (Elaeagnus angustifolia)
19. Tree of Heaven (Ailanthus altissima)
20. White Mulberry (Morus alba)

T. In areas where Japanese knotweed (Polygonum cuspidatum) is the dominant vegetation cover type, the Japanese knotweed shall be treated by injection method to the extents and limits shown on the Contract Drawings or as directed by the Engineer. The Contractor shall use a hand-held injection device that delivers the specified amount of the herbicide. Make a hole through both sides of the of the individual stems approximately 6-inches above the ground, just below a node, using an awl or other pointed tool. Inject 5 ml of undiluted product directly into this hole in the hollow stem. Treat each stem of the knotweed plant.

U. In areas where Bamboo spp. occurs, the following treatment protocol shall be followed:

1. The above ground portion of the bamboo shall be cut or chopped and the cuttings removed from the site.
2. The bamboo shall then be allowed to re-grow to a height of three feet.
3. The bamboo growth shall be treated with Glyphosate herbicide as described above and at application rates specified by the manufacturer.
4. Cut and spray activities on the bamboo shall be performed to the extents and limits shown on the Contract Drawings or as directed by the Engineer.

5. The bamboo will need to be cut and sprayed multiple times in order to achieve effective control. The timing of cut and spray activities shall be as indicated above and as directed by the Engineer. A minimum of four weeks shall occur between individual cut and spray treatments. All bamboo cut and spray activities shall occur during the growing season as indicated above. Optimum control of bamboo is achieved when cut and spray operations occur between August and October.

END OF SECTION

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EMBANKMENT AND CHANNEL PROTECTION

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall perform all work necessary to install rip-rap stone where directed by the Engineer and as shown on the Contract Drawings, to protect the soil surface from erosive forces and/or improve the stability of soil slopes as well as water feature bottoms that are subject to seepage or have poor soil structure.

B. In general, rip-rap stone shall be utilized for both temporary and permanent constructed features such as erosion control features, channel side slopes and bottoms, grade sills, slope drains, grade stabilization structures, storm drains, and cut and fill slopes subject to seepage, erosion or weathering, particularly where conditions prohibit the establishment of vegetation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.03 PAYMENT

A. The price bid shall be a unit price per CUBIC YARD of RIPRAP, and shall include furnishing of all labor, materials, equipment and expenses necessary to complete the work, including preparation of the subgrade, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Prior to the placement of riprap, the Contractor must submit a representative sample to the Engineer and obtain approval, in writing.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 RIPRAP

A. Stones shall be a well-graded mixture with 50% by weight larger than the specified design size. The diameter of the largest stone size in such a mixture shall be 1.5 times the d50 size with smaller sizes grading down to 1 inch. The stone size installed shall be as directed by the Engineer and as shown on the Contract Drawings.

B. The minimum layer thickness shall be 1.5 times the maximum stone diameter, but in no case less than 6 inches or as specified on the Contract Drawings.

C. Stones for rip-rap shall be hard, durable quarry materials. They shall be angular and not subject to breaking down when exposed to water or weathering. The specific gravity shall be at least 2.5.

D. Stones shall be free of decomposed stone, clay rock dust and other objectionable material. Existing stone walls and broken concrete or recycled stone shall not be used as stones. Broken concrete is not acceptable.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

A. Prepare the subgrade for stones to the required lines and grades shown on the plans. Compact any fill required in the subgrade to a density approximating that of the undisturbed material or overfill depressions with stones. Remove brush, trees, stumps and other objectionable material. Cut the subgrade sufficiently deep so that the finished grade of the stones will be at the elevation of the surrounding area. Channels shall be excavated sufficiently to allow placement of the stones in a manner such that the finished inside dimensions and grade of the stones meet design specifications.

3.02 RIP-RAP STONE PLACEMENT

A. Place stones so that it forms a dense, well-graded mass of stone with a minimum of voids. The desired distribution of stones throughout the mass shall be obtained by selective loading at the quarry and controlled dumping during final placement. Place stones to its full thickness in one operation. Do not place stones by dumping through chutes or other methods that cause segregation of stone sizes. Be careful not to dislodge the underlying base or filler when placing the stones.

B. The toe of the stones shall be keyed into a stable foundation at its base. The toe shall be excavated to a depth of 2.0 feet. The design thickness of the stones shall extend a minimum of 3 feet horizontally from the slope. The finished slope shall be free of pockets of some stone or clusters of large stones. Hand placing will be required to achieve proper distribution of stone sizes to produce a relatively smooth, uniform surface. The finished grade of the stones shall blend with the surrounding area.

END OF SECTION

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SECTION 32 01 13.62

ASPHALT SURFACE TREATMENT

PART 1 GENERAL

1.01 REQUIREMENTS

A. The "NYC DEP BWSO Standard Sewer and Water Main Specifications – Section 71.31 Temporary Restoration of Pavements" is hereby incorporated into this specification and is available here: https://www1.nyc.gov/assets/ddc/downloads/publications/infrastructure/sewer_and_water_main_std_specs_14-07-01.pdf.

B. All temporary pavement restoration must be done in conformance with Standard Sewer and Water Main Specifications – Section 71.31 Temporary Restoration of Pavements

C. Unless otherwise specified or directed, in all areas (except projects within the Borough of Staten Island) where existing asphalt pavement is disturbed by the Work done under this Contract (i.e., excavations, test pits) but not permanently restored immediately thereafter, the Contractor shall temporarily restore the surface of the asphalt pavement where disturbed with not less than four (4) inches of binder mixture or asphaltic concrete mixture (as applicable, and as determined by the Engineer) on soil immediately after completion of backfilling and compactions.

D. Unless otherwise specified or directed, in all areas where an existing sidewalk pavement of any type is disturbed by the Work done under this Contract (i.e. over trenches, excavations, test pits) but not permanently restored immediately thereafter, the Contractor shall temporarily restore the surface of concrete or bituminous sidewalk pavements where disturbed with not less than two (2) inches of binder mixture or asphaltic concrete mixture (as applicable, and as determined by the Engineer) on soil immediately after completion of backfilling and compactions.

E. All temporary pavements must be thoroughly compacted and laid flush with the surrounding pavement.

F. Such temporary restoration must be maintained in acceptable condition until replaced by final restoration. Unless otherwise specified or directed, the temporary surfacing will not be replaced with the permanent restoration for a period of not less than six (6) weeks, after it has been laid to the satisfaction of the DEP.

G. Restoration of permanent roadway pavement must include the restoration of each kind of roadway pavement shown, specified or required. The Contractor shall obtain the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

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SECTION 32 01 13.62

ASPHALT SURFACE TREATMENT

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 57 13 – Temporary Erosion and Sediment Control

B. Section 02 21 00 – Site Surveys

C. Section 31 23 16 – Excavation

D. Section 32 12 16 – Asphalt Paving

E. Section 32 17 23 – Color Seal

F. Section 32 92 19 – Seeding

F. Section 02 41 10 – Demolition and Removals

G. Section 03 30 00 – Cast- in- Place Concrete

1.03 PAYMENT

A. There will be no separate payment for this work, the cost shall be included in prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. New York City Department of Transportation ("NYCDOT") Standard Highway Specifications

B. New York City Department of Environmental Protection Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. For roadway restoration pavement only, the results of all measurements and tests verifying thickness of pavement and composition by cores, certified a New York State Licensed Testing Laboratory, must be submitted to the Resident Engineer.

1.07 QUALITY CONTROL (NOT USED)

1.08 MAINTENANCE OF TEMPORARY RESTORATIONS

A. The Contractor shall maintain all temporary restoration in a suitable and safe condition for traffic until Final Acceptance.

B. If settlement occurs or other defect develop in temporary pavement, which in the opinion of the Engineer may cause hazards or undue inconvenience to pedestrian or vehicular traffic, the Contractor shall immediately restore such pavement to proper grade or otherwise repair the defects.

PART 2 PRODUCTS

2.01 MATERIALS

A. The material for temporary pavement shall be either Binder Mixture or Asphaltic Concrete Mixture, as applicable, and as determined by the Engineer. Binder Mixture and Asphaltic Concrete Mixture shall be in conformance with New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 3.01 - Asphalt Paving Mixtures (Binder, Asphaltic Concrete).

B. The material for subbase required under temporary pavement on all projects within the Borough of Staten Island shall be Recycled Portland Cement Concrete (Material D). Recycled Portland Cement Concrete (Material D) shall be in conformance with New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 6.67 - Subbase Course, Select Granular Material.

C. The materials for asphalt pavement to be restored must conform in all respects to the requirements set forth in Section 32 12 16 – Asphalt Paving.

PART 3 EXECUTION

3.01 RESTORATION OF UNPAVED ROADWAYS, SIDEWALKS, ETC.

A. Unless otherwise shown, specified or directed, all unpaved roadways, unpaved gutters and unpaved sidewalk areas affected by the Work done under this Contract shall be restored by the Contractor to the same condition in which they were at the time of the opening of bids for this Contract, as determined by DEP.

3.02 CONSTRUCTION METHODS

A. Temporary restoration of pavements must be done according to the requirements section herein, and New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 4.02 - Asphaltic Concrete Wearing Course.

B. The Contractor will be required to replace all permanent pavement disturbed in the course of the Work, in accordance with the requirements set forth in DEP Standard Specifications for On-Site Green Infrastructure Section 32 12 16 – Asphalt Paving.

C. When performing final restoration Work no more than six hundred (600) linear feet of trench shall be excavated pending installation of concrete or asphaltic concrete base at any time.

D. All excavations must be backfilled and compacted to the underside of the pavement in accordance with Section 31 23 16 - Excavation. Immediately after any street opening has been backfilled and the compaction completed, the Contractor shall install the permanent or temporary pavement as directed by the Engineer. All pavement materials and methods of restoration must comply with Section 32 12 16 – Asphalt Paving. The temporary pavement must consist of binder mixture or asphaltic concrete mixture (as applicable, and as determined by the Engineer) as specified in Section 2.01, flush with the adjacent pavement surfaces. Immediately upon completion of the installation of the temporary pavement, all equipment construction materials and debris must be removed from the Site.

E. All saw cutting of pavements must be done in conformance with Section 02 41 10 – Demolition and Removals. There shall be no separate payment for saw cutting.

F. All pavement excavation must be done in conformance with Section 31 23 16 - Excavation, Subsection 3.08.

G. Final restoration of pavements must conform to the requirements herein.

H. Whenever a permanent pavement is to be installed and a temporary restoration has been used, all of the temporary pavements must be removed, and the new pavement shall be installed.

I. All concrete used for base shall be Class B-32 (3,200-psi) Type 1A. For bus stops or reinforced pavements, Class A-40 (4,000-psi) Type 11A shall be used.

J. When a permanent full depth concrete pavement is to be installed as the final pavement, all Work must be done in accordance with Department of Transportation Standard Detail of Construction No. H-1042B.

K. When existing granite block pavements are encountered the Contractor shall reinstall the granite block on a new six (6) inch concrete base, unless more than fifty (50) percent of the adjacent street is already patched with asphalt. In that case, the Contractor shall replace the granite block with a three (3) inch asphaltic concrete top course on a six (6) inch to nine (9) inch concrete base. Unless otherwise directed by the Borough Administrative Superintendent of Street Maintenance, all granite blocks shall be cleaned and delivered to the Borough Highway Yard of the Department of Transportation. The Contractor shall coordinate delivery with the Borough's Administrative Superintendent of Street Maintenance. In the restoration of block pavements, the edges of the pavement shall be toothed or racked back.

L. All roadway markings including crosswalks and thermoplastic lane dividers removed as a result of construction must be replaced in kind to NYCDOT Highway Design Typical Markings and the Standard Highway Specifications of the New York City Department of

Transportation.

M. All sidewalks, curbs, and concrete bus stops disturbed as a result of construction must be restored in strict accordance with the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

N. All restorations must conform to the standards and specifications of the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

O. The Contractor will be required to construct pavement keys and apply tack coat in accordance with the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

P. Asphalt pavement, driveways and sidewalk pavements, crosswalks, curbs, etc., must be satisfactorily restored and adjusted by the Contractor at such times as may be directed by the DEP and driveway pavements must be restored in whole flags, squares or sections, and in general, must be restored with concrete laid on six (6) inch thick foundation materials unless otherwise specified. All Work and materials used in such restoration and adjustment must conform in all respects to the standards and specifications of the Department of Transportation for similar Work and materials.

Q. If asphalt pavement, driveway and sidewalk pavements, crosswalks, curbs, etc., are specified in the Contract Documents to be lain where none existed at the time the bids for this Contract were opened, the Contractor shall excavate, remove and grade such portions of the areas where the new asphalt pavement, driveways, sidewalks, crosswalks, curbs, etc., and their foundations are to be placed upon and are necessary for the Work and the Contractor will be required to make a permanent restoration of them. Payment for the Work performed will be made under the appropriate bid items.

R. Where asphalt pavement, driveway and sidewalk pavements, crosswalks, curbs, etc., are not specified in the Contract Documents to be laid where none existed at the time the bids for this contract were opened; however, if the Engineer orders such Work done, payment may be made for the Work performed in accordance with Section 03 30 00 Cast- in-Place Concrete and Section 32 12 16 – Asphalt Paving.

S. The Contractor shall install new curb and concrete sidewalk within the project limit at the locations where required due to missing or defective curb and/or sidewalk as directed by the Engineer. New curbs and sidewalks must be constructed in compliance with NYCDOT's requirements and specifications.

T. Prior to the start of final restoration, the Contractor will be required to submit to the Engineer, for approval, a layout of the proposed final restoration.

3.03 THICKNESS OF PAVEMENT AND COMPOSITION, ETC., OF PAVEMENT BY CORES

A. Cores will determine the thickness of all pavements. Tests for composition and all other testing required by the DEP will be determined from cores. Unless otherwise specified, cores must be taken and tested at the Contractor's expense by an approved independent New York State Licensed Testing Laboratory. The taking of all cores and all tests to be performed must be in accordance with the requirements of the Department of Transportation. The results of all measurements and tests will be certified by the Testing Laboratory and must be submitted to the Resident Engineer.

3.04 CLEANING UP

A. At such times as may be directed, the Contractor shall remove from the streets and Site of the Work, all materials which were placed thereon by the Contractor as a consequence of performing this Work, and which are not required by the Contract to be left as part of the finished Work. The entire Work and portions of the streets affected thereby must be left clean and in a satisfactory condition. The sidewalks and crosswalks must be swept clean of all material that may have come thereon by reason of the Work under this Contract, and if required, the sidewalks and crosswalks must be sprinkled with water during the sweeping. No separate or additional payment will be made for any required cleanup Work.

3.05 BROOM CLEANING

A. The Contractor shall broom clean all streets after final restoration has been made.

3.06 GUARANTEE AND MAINTENANCE PERIOD (Not Used)

3.07 ACCEPTANCE OF FINAL RESTORATION

A. The DEP will secure acceptance of final restoration from the Department of Transportation as a condition for final payment to the Contractor.

3.08 SPECIFIC PAVEMENT RESTORATION PROVISIONS

A. The Contractor shall restore the pavements as encountered and as directed by the Engineer.

B. The Contractor shall restore all existing sidewalk and curb structures that are disturbed due to the construction operations.

C. The Office of Green Infrastructure or authorized representative will make all necessary inspections of restoration.

3.09 PAVEMENT MARKINGS (THERMOPLASTIC REFLECTIVE STRIPING AND CROSSWALKS)

A. All roadway markings removed or disturbed during construction must be replaced in accordance with New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 6.44 – White and Yellow Thermoplastic Reflectorized Pavement Markings

B. All new roadway markings must be applied in accordance with the New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 6.44 – White and Yellow Thermoplastic Reflectorized Pavement Markings.

C. All roadway markings including crosswalks and thermoplastic lane dividers removed as a result of construction must be replaced in kind to the NYCDOT Highway Design Typical Markings and the Standard Highway Specifications of the New York City Department of Transportation.

3.10 GRASS RESTORATION

A. All grass within or around the green infrastructure practice, that is impacted by construction, shall be restored to existing conditions in accordance with Section 01 57 13 – Temporary Erosion and Sediment Control and Section 32 92 19 – Seeding.

END OF SECTION

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SECTION 32 12 16

ASPHALT PAVING

PART 1 GENERAL

1.1 REQUIREMENTS

A. The Contractor shall provide asphaltic concrete paving constructed on properly prepared subgrades and in conformance to the required lines, grades and typical cross sections shown on the Contract Drawings.

B. Under this Section, the Contractor shall apply a color seal coat system, games and park leaf emblem to the asphaltic pavements on NYC Parks - owned Properties and/or restoration of roadway and parking markings in accordance with the plans, Specifications and directions of the Engineer.

C. PAINTED GAMES, including Potsy, Skelly, Boxball and Nation, shall conform to NYC Parks and Recreation Standard Detail "PAINTED GAME LAYOUT" and PAINT PARK LEAF shall conform to NYC Parks and Recreation Standard Detail "PARK LEAF OUTLINES", Stencil No.1 Basketball Court Tipoff Circle.

D. Under these items, the Contractor shall furnish and install THERMOPLASTIC HEAT-FUSED PREFORMED REFLECTIVE MARKINGS (HFPRM) - A.D.A. PARKING SYMBOL AND SIGN, primarily (but not exclusively) for the purpose of compliance with the Americans With Disabilities Act (A.D.A.). Markings, signs and sign posts shall be installed in accordance with the plans, specifications, and the direction of the Engineer.

E. Under this Section, the Contractor shall apply waterborne and solvent borne paints onto pavement for lines, letters, symbols, crosswalks and any other pavement markings in the right-of-way, in accordance with the applicable NYSDOT Standard Specifications and in accordance with the plans, specifications and directions of the Engineer.

F. Under this Section, the Contractor shall conduct hydrant flow testing of the asphalt area to demonstrate constructed grades match plans and tributary drainage areas reach GI capture areas as indicated in Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 23 16 – Excavation

C. Section 32 01 13.62 – Asphalt Surface Treatment

D. Section 32 12 73 – Asphalt Paving Joint Sealant

E. Section 03 30 00 – Cast-In-Place Concrete

F. Section 31 35 10 – Embankment and Channel Protection

G. Section 33 44 31 – Stormwater Membrane Filtration

H. NYSDOT Standard Specifications for Pavement Marking Material Section 727-09 – Traffic Paint

I. NYSDOT Standard Specifications for Pavement Marking Material Section 727-05 – Glass Beads for Pavement Markings

1.3 PAYMENT

A. The price bid for ASPHALT PAVING shall be unit price per SQUARE YARD and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, top course, tack coat, binder course, leveling course, joint sealants, minimum base course or foundation material for pavement type identified, and traffic paint marking, hydrant flow testing all in accordance with the Contract Documents, to the satisfaction of the Engineer.

B. The price bid for MILLING AND PAVING shall be unit price per SQUARE YARD and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, sawcutting, joint sealants, tack coat, top course, and traffic paint marking, all in accordance with the Contract Documents, to the satisfaction of the Engineer.

C. The price bid for FOUNDATION MATERIAL FOR ASPHALT shall be unit price per CUBIC YARD for required Base Course which exceeds quantities required for pavement type identified in Contract Drawings and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including preparation, all in accordance with the Contract Documents, to the satisfaction of the Engineer.

D. The prices bid shall be a unit price per SQUARE YARD of COLOR SEAL COAT of the paint lines applied and accepted and shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the Work, including preparation of surfaces, patching mix, resurfacer coats, intermediate coats, wearing coats and painted lines, in accordance with the plans and Specifications to the satisfaction of the Engineer.

E. The prices bid shall be a unit price per EACH PAINTED GAME and/or PARK LEAF applied and accepted and shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the Work, including preparation of surfaces, patching mix, resurfacer coats, intermediate coats, wearing coats and painted lines, in accordance with the plans and Specifications to the satisfaction of the Engineer.

F. The prices bid shall be a unit price per SQUARE YARD of CROSSWALK PAINTING, where a crosswalk was not previously marked, and shall include the cost of furnishing all labor, material equipment, incidental expenses necessary to complete the Work, in accordance with the plans and Specifications to the satisfaction of the Engineer. No separate payment will be made for restoration of existing Right of Way (ROW) pavement marking or line striping, see Section 32 01 13.62 Asphalt Surface Treatment.

G. The prices bid shall be a unit price per LINEAR FOOT of 4" WIDTH THERMOPLASTIC LINE PAINTING WITHIN NYC PARK'S PROPERTY, and shall include the cost of furnishing all labor, material equipment, incidental expenses necessary to complete the Work, in accordance with the plans and Specifications to the satisfaction of the Engineer.

H. The prices bid shall be a unit price per EACH of THERMOPLASTIC HFPRM SYMBOL PARKING SPACE MARKING, and shall include the cost of furnishing all labor, material equipment, incidental expenses necessary to complete the Work, in accordance with the plans and Specifications to the satisfaction of the Engineer.

I. The prices bid shall be a unit price per SQUARE FOOT of RIGHT-OF-WAY TRAFFIC PAINTING, and shall include the cost of furnishing all labor, material equipment, incidental expenses necessary to complete the Work, in accordance with the plans and Specifications to the satisfaction of the Engineer.

J. The prices bid shall be a unit price per LINEAR FOOT of 2-INCH LINE PAINTING, and shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the Work, including preparation of surfaces, patching mix, resurfacer coats, intermediate coats, wearing coats and painted lines, in accordance with the plans and Specifications to the satisfaction of the Engineer.

K. The prices bid shall be a unit price per LINEAR FOOT of 4-INCH LINE PAINTING, and shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the Work, including preparation of surfaces, patching mix, resurfacer coats, intermediate coats, wearing coats and painted lines, in accordance with the plans and Specifications to the satisfaction of the Engineer.

L. THERMOPLASTIC HFPRM – A.D.A. PARKING SYMBOL AND SIGN is a unit price for EACH ADA parking space and sign, steel drive rail post, sawcutting, excavation, removals, backfilling, average concrete, and site/pavement restoration, all in accordance with the Contract Documents and the directions of the Engineer. The following signs are considered incidental to this item, when required by the Contract Documents.

1. Reserved Accessible Parking
2. Van Accessible Parking
3. Wheelchair Ramp
4. Accessible Entrance
5. Blue Arrow

6. Accessible Symbol

M. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be executed as described under Section 32 12 73 – Asphalt Paving Joint Sealants.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM D1557 - Tests for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb (4.5 kg) Rammer and 18-in. (457-mm) Drop

B. ASTM D2049 - Tests for Relative Density of Cohesionless Soils

C. ASTM D3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics

D. ASTM D4354 - Practice for Sampling of Geosynthetics for Testing

E. ASTM D4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

F. ASTM D4439 - Terminology for Geotextiles

G. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity

H. ASTM D4533 - Test Method for Index Trapezoid Tearing Strength of Geotextiles

I. ASTM D4595 - Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

J. ASTM D4632 - Test method for Grab Breaking Load and Elongation of Geotextiles

K. ASTM D4759 - Practice for Determining the Specification Conformance of Geosynthetics

L. ASTM D4751 - Test Method for Determining Apparent Opening Size of a Geotextile

M. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

N. ASTM D4873 - Guide for Identification, Storage and Handling of Geotextiles

O. Federal Highway Administration (″FHWA") - Geosynthetic Design and Construction Guidelines, Publication No. FHWA HI-95-038, May 1995

P. Geosynthetic Accreditation Institute ("GAI") - Laboratory Accreditation Program (LAP)

Q. International Standards Organization ("ISO") 9002 - Quality System Certification

R. NYS Department of Transportation ("NYSDOT") Standard Specifications

S. NYCDOT Standard Highway Specifications 1.4.3 of GS11.

T. Federal Specification TT-P-115 - Paint, Traffic, Highway, White and Yellow

U. Federal Specifications, U.S. General Services Administration

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. Contractor shall furnish all Working Drawings and Specifications in accordance with the General Conditions and Section 01 33 00 – Submittal Procedures. The following requirements are to be submitted as a minimum.

1. The bituminous mix design for the asphalt base, binder and wearing courses, which must include the sources of all ingredient materials, the penetration of the asphaltic cement and the percentages by weight and the number of pounds of each of the materials making up one batch.

2. The laboratory analysis of the bituminous mixes and the laboratory compacted densities for the base, binder and wearing courses.

B. At the time of the Pre-construction meeting, and in accordance with the Specifications, the Contractor shall be required to submit, for approval, complete details of the color seal coat system it proposes to use. The Specifications of all information (products or systems, manufacturer's names, product description, technical and laboratory data, mixing information, methods of application, rates and all other data) as may be required to demonstrate to the satisfaction of the Engineer that the color seal coat system the Contractor proposes to use meets the requirements of these Specifications.

C. The Contractor shall be required to submit color samples for approval by the Engineer.

D. Paint Substitution: A written request for paint substitution, along with manufacturer’s data sheets shall be submitted for approval a minimum of two (2) weeks prior to the intended date of paint application. All paint substitutions must be approved in writing.

E. Paint Stencil: Shop drawings shall be prepared at the scale of the construction documents, or larger, and shall contain all pertinent information regarding layout and material selection of painting stencils. These drawings shall be submitted to the Engineer for approval.

F. Thermoplastic Parking Symbol

1. Approval: The Contractor shall submit for approval complete details of the thermoplastic pavement graphics system he proposes to use. The specifications of all information (products specification sheet, manufacturer's names, product description, MSDS sheets, installation instructions, technical and laboratory data) as may be required to demonstrate to the satisfaction of the Engineer that the system the Contractor proposes to use meets the requirements of these specifications. Submit technical data on adhesives, primers, or sealers if required.

2. Samples: The Contractor shall submit one (1) 1 ½" x 1 ½" sample of each color to be used in this contract. No work shall be performed until the color samples are approved.

G. ADA Parking Sign

1. Shop Drawings- Contractor shall submit shop drawings showing the layout of sign fabrication, sizes and shapes of members. Contractor shall also submit proposed graphics, including typography and symbols for approval.

2. Samples- Upon request, samples of all materials and products, color samples, and all finishes shall be submitted for approval prior to fabrication.

3. All submittals shall be in accordance with the requirements of the General Conditions, Section C, Special Provisions, Article 11 and be submitted prior to manufacture.

H. Hydrant Flow Testing Plan, including:

1. Test locations and hydrants
2. Hose routing plan to practice
3. Equipment list (diffusers, gauges, hoses, dechlorination method)
4. Traffic and pedestrian control plan

1.7 QUALITY CONTROL (NOT USED)

1.08 DEFINITIONS

A. California Bearing Ratio ("CBR"): The ratio of (1) the force per unit area required to penetrate a soil mass with a 19 sq. cm (3 sq.in.) circular piston (approximately 51 mm (2 in.) diameter) at the rate of 1.3mm/min (.05 in/min) to (2) that required for corresponding penetration of a standard material.

B. Minimum Average Roll Value ("MARV"): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

C. Typical Roll Value: Property value calculated from average or mean obtained from test data.

PART 2. PRODUCTS

2.01 MATERIALS

A. Geotextile

1. Geotextile shall conform to Section 33 44 31 – Stormwater Membrane Filtration.

B. Asphalt Pavement

1. Provide asphaltic concrete pavement conforming to the requirements specified in this section and to the following standards:

a. Bottom Course: Foundation Material for Asphalt (Broken Stone), NYCDOT, Bureau of Highway Operations Standard Specifications, Section 2.02, Aggregate-Coarse, Type 1, Grade B, Sizes No. 1, No. 2 and No. 4. Provide bottom course consisting of a uniform mixture of broken stone, Size Nos. 1 and 2, and add No. 4 as a filler after the coarser mixture has been rolled and compacted.

b. Tack Coat: Asphalt emulsion, NYCDOT Standard Specifications, material designation 4.01.

c. Binder Course: Binder mixture, NYCDOT Standard Specifications, Subsection 3.01, Table 3.01-I, Type 3.

d. Leveling Course for Tennis Courts & Running Tracks: Type 7F (High Friction) - Marshall Design Stability, N, min.: 6700; Flow, 0.25 mm, min: 8; Air Voids, %: 2.0-4.0, Voids in Mineral Agg. (VMA), %, min: 16.0.

e. Wearing Course:

i. NYC Parks Department Properties and New York City Housing Authority Playgrounds (NYCHA): Type 7F (High Friction) - Marshall Design Stability, N, min.: 6700; Flow, 0.25 mm, min: 8; Air Voids, %: 2.0-4.0, Voids in Mineral Agg. (VMA), %, min: 16.0.

ii. NYCDOT Properties and NYCHA Parking Lots: NYCDOT Standard Specifications, Subsection 3.01, Table 3.01-I, Type 6F.

C. Asphaltic Pavement for Walks

1. Asphaltic Pavement for walks shall be identified on Contract Drawings. Walks are generally described as pedestrian pathways that does not support vehicular use.

2. Provide asphaltic pavement for walks conforming to the requirements specified in this section and to the following standards:

   a. Bottom Course: Asphaltic concrete mixture, NYCDOT Standard Specifications, Subsection 3.01, Table 3.01-I, Type 3

   b. Wearing Course: Type 7F (High Friction) - Marshall Design Stability, N, min.: 6700; Flow, 0.25 mm, min: 8; Air Voids, %: 2.0-4.0, Voids in Mineral Agg. (VMA), %, min: 16.0.

   c. Tack Coat: Asphalt emulsion, NYCDOT Standard Specifications, material designation 4.01

D. Recycled Asphalt Pavement (R.A.P)

   a. Within NYC Parks' properties, the base course asphalt mix for full depth asphalt pavement courts may contain a maximum of 15% by weight of Recycled Asphalt Pavement (R.A.P.) material.

   b. 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. R.A.P. shall be tested by an approved laboratory for (%) percent asphalt cement before mixing. R.A.P. shall be screened prior to mixing so that final mix meets the specification delineated below. The City reserves the right to reject the R.A.P. asphalt mix if in the determination of the Engineer, the mix is contaminated with dirt, debris, garbage, metal, or glass. R.A.P. is not acceptable for the top courses of asphalt pavement.

   c. R.A.P. shall comply with N.Y.S. D.O.T. Standard Specifications, Section 703-09 "Reclaimed Asphalt".

   d. At the discretion of the Engineer the top course may consist of maximum of 15% by weight of RAP, however RAP shall not be utilized for the top course of asphalt pavement within tennis courts.

2.02 COLOR SEAL COAT FOR ASPHALT SURFACES

A. The color seal coat system consists of multiple resurfacer coats, three (3) intermediate coats and one (1) wearing coat. Patching mix shall be installed as necessary and as described under Part 3.

B. Patching Mix (also known as leveling mixture) The patching mix shall be "California Court Patch Binder", as manufactured by California Sport Surfaces, Andover, MA, "Laykold Acrylic Deep Patch" as manufactured by Advanced Polymer Technology, Harmony, PA, "Acrylic Patch Binder C1480" as manufactured by SportMaster Sport

Surfaces, Sandusky, OH, “Action Pave Acrylic Resurfacer” as manufactured by Copeland Coating Co., Nassua, NY, or approved equal. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be Armor Crack Repair System, or approved equal.

C. Resurfacer coats (also known as Filler Coat) shall consist of a mixture of acrylic resurfacer and No. 40-60 mesh Silica sand. The resurfacer shall be “California Acrylic Resurfacer”, as manufactured by California Sport Surfaces, Andover, MA; “Laykold Acrylic Resurfacer” as manufactured by Advanced Polymer Technology, Harmony, PA; “Acrylic Resurfacer C1300” as manufactured by SportMaster Sport Surfaces, Sandusky, OH, “Action Pave Acrylic Resurfacer” as manufactured by Copeland Coating Co., Nassau, NY, or approved equal.

The sand shall be mixed with the resurfacer at the rate of 600 to 800 pounds of sand to 55 gallons of undiluted resurfacer, or at such other rate as the manufacturer shall require to meet job conditions. Water shall be added per manufacturer's specifications.

D. The intermediate coats shall be full color acrylic filler coatings consisting of colored acrylic latex emulsion compounded with Silica sand. The intermediate coats shall be “Plexichrome” or “DecoColor MP”, as manufactured by California Sports Surfaces, Andover, MA; “Laykold ColorCoat Concentrate” as manufactured by Advanced Polymer Technology, Harmony, PA; “Color Concentrate” as manufactured by SportMaster Sport Surfaces, Sandusky, OH, “Action Pave Acrylic Filler” as manufactured by Copeland Coating Co., Nassau, NY, or approved equal.

Sand shall be No. 80-100 mesh Silica sand. Sand and water shall be added per manufacturer's specifications.

E. The wearing coats shall be full color acrylic latex emulsion. The wearing coats shall be either “Plexichrome” or “DecoColor MP” as manufactured by California Sports Surfaces; “Laykold Colorcoat Concentrate” as manufactured by Advanced Polymer Technology, Harmony, PA; “Color Concentrate” as manufactured by SportMaster Sport Surfaces, Sandusky, OH, “Action Pave Acrylic Finish” as manufactured by Copeland Coating Co., Nassau, NY, or approved equal. Colors shall be as shown on plans. Water shall be added per manufacturer's specifications.

F. Line paint to be installed on the color seal coat shall be a 100% acrylic emulsion. All line paint to be textured unless otherwise shown on the drawings. The line paint shall be thinned with water only. The paint shall be suitable for application by brush, spray or roller. Line color shall be as shown on the plans.

The paint shall be equal to “Hi Hide Line paint”, as manufactured by California Sports Surfaces, Andover, MA, Laykold Line Paint as manufactured by Advanced Polymer Technology, Muskegon, MI, SportMaster Line Paint as manufactured by SportMaster Sport Surfaces, Sandusky, OH, or approved equal.

2.03 LINE PAINTING

A. Paint shall comply with applicable portions of Federal Specification No. TT-P-1952D for "Traffic and Airfield Water Emulsion Paint." And No. TT-P-1511A for "Wet Adhesion" in addition to the A.S.T.M. standards as follows:

Physical Properties	**A.S.T.M. Test Methods**
Mandrel Bend Test of Attached Organic Coatings (flexibility)	D 522
No-Pick-Up Time of Traffic Paint	D 711
Conducting Road Service Tests on Fluid Traffic Marking Materials	D 713
Testing Water Resistance of Coatings Using Water Immersion	D 87-0
Abrasion Resistance of Organic Coatings by Falling Abrasive	D 968
Scrub Resistance	D 2486

B. Acrylic-based paint shall be 100% acrylic waterborne road marking paint similar to "Acrylic Traffic Paint," Series 9900 as manufactured by Mercury Paint Corp., Brooklyn, NY or "Ultra-Hide Acrylic Traffic Paint" as manufactured by Glidden Co., or approved equal. Color shall be white unless otherwise shown on the Contract Drawings.

C. The materials for roadway pavement to be restored must conform in all respects to the requirements set forth in the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

D. Payment Schedule: The Contractor will be paid at the following rates for the different widths of line painting, based on the unit price for installation of 2-Inch width line painting.

LINE WIDTH	LINE UNITS	PAYMENT PER LINEAR FOOT INSTALLED
2-Inch	1.0 (Base Unit)	100% of Unit Bid Price
3-Inch	1.25	125% of Unit Bid Price
4-Inch	1.5	150% of Unit Bid Price

2.04 RIGHT-OF-WAY TRAFFIC PAINTING

A. The material shall conform to the applicable sections of the latest NYSDOT Standard Specifications Section 727-09 for “Traffic Paint” and Section 727-05 “Glass Beads for Pavement Markings”.

B. Right-of-Way Traffic Painting shall conform to the following:

1. Be formulated for use as a pavement marking material;

2. Be VOC compliant and lead chromate free;

3. Yellow paints must use organic yellow pigments Color Index Pigment Yellow 65 (C.I. 11740) and/or 74 (C.I. 11741);

4. Display no bleeding on the surface upon which the paint is applied;

5. Conform to current Federal, State and Local air pollution regulations, including those for the control (emission) of volatile organic compounds (VOC) as established by the U.S. EPA, and the NYSDEC.

C. Right-of-Way Traffic paint shall conform to the following composition requirements:

1. Percentage of Pigment must be within 58.0% - 62.0% as determined by ASTM D3723.

2. Percentage of Total Solids must be a minimum of 76.0 % as determined by ASTM D3723.

3. Percentage of Non-Volatile Vehicle much be a minimum of 43.0 % as determined by ASTM D3723.

4. The manufacturers certified organic yellow pigment content shall be used to determine the final laboratory test results for: total pigment (%), and for nonvolatile vehicle (%). The Engineer reserves the right to validate the manufacturers "certified" organic yellow pigment content through outside, independent laboratory testing.

D. Right-of-Way Traffic paint shall conform to the following Color requirements when viewed under North Standard Daylight at a 15 ± 1 mils wet film thickness with no glass beads applied as determined by ASTM D1535:

1. White: Approximate visual color match to Munsell Book Notation N 9.5/0

2. Yellow: Approximate visual color match to Munsell Book Notation 10YR 8/14 and within the following chromaticity coordinate limits when tested under ASTM E1347

E. Right-of-Way Traffic paint shall conform to the following Directional Reflectance requirements as determined by ASTM E1347:

1. Percentage of directional reflectance must be a minimum of 84.0 % for White Paint

2. Percentage of directional reflectance must be a minimum of 54% for Yellow Paint

F. White traffic paint shall has a maximum Yellowness Index of 0.12 as determined by ASTM D1925 at 2^{o} observer angle and C Illuminate

G. The viscosity of Right-of-Way Traffic paint shall be within 75 - 95 Kreb Units at 77^{o} F as determined by ASTM D362 Procedure B.

H. Right-of-Way Traffic Paint shall conform to the following Dry Opacity requirements as determined by ASTM D2805:

1. Minimum contrast ratio of 0.95

2. Application at 3 1/2 inches wide, wet-film thickness of 5 mils to white and black contrast panels matching Lenta Form 5C or equivalent

3. Dry time of 1 hour minimum

I. Right-of-Way Traffic paint shall conform to the following Abrasion Resistance requirements as determined by ASTM D4060:

1. Four plate samples for each lot will be prepared for testing on the Taber Abaser. The paint will be sprayed on steel plates,or applied by other suitable means so as to ensure a nominal 15 mil wet film thickness on each plate. Plates will be cured at standard laboratory temperature and humidity for 2 to 24 hours. The paint abrasion plates will be cleaned, dressed, and baked at 221°F for 18 hours. After baking, the plates will be allowed to cool in a desiccator for one hour and then weighed. The plates will be abraded for 1000 cycles on the Taber Abraser. The Taber Abraser will be operated with 1.10 lb weights and CS 10 wheels on the machine. After abrading, the samples will be cleaned with a soft brush, placed in a desiccator for one hour and weighed again. The average weight loss for the four plates shall not exceed 0.00176 oz.

J. Flexibility of the Right-of-Way Traffic paint shall be such that there is no cracking or flaking visible. Flexibility shall be determined in accordance with Method B of ASTM D522.

K. Freeze-Thaw Stability of the Right-of-Way Traffic paint shall have no coagulation or change in consistency greater than 15 Kreb Units as determined by ASTM D562.

L. For waterborne paint only, heat stability of Right-of-Way Traffic paint when tested in an oven at 120° +/- 2° F shall be such that there is no coagulation, discoloration, or change in consistency greater than 15 Kreb Units as determined by ASTM D562.

M. The spectrum of the Right-of-Way Traffic Paint, as determined by ASTM D3168 for waterborne or ASTM D261 for solvent-borne, must be analyzed and maintained as a base record. Any subsequent samples must be a reasonable match to the original formulation spectrum accepted by the Materials Bureau for the Approved List.

2.05 STEEL DRIVE RAIL

A. Steel Drive rail shall be a single length of flanged channel section steel that shall weigh three (3) pounds per foot. Length shall be twelve (12) feet.

1. The minimum dimensions of posts shall be as follows:

Width of Flange Face	Width of Back	Depth from Face of Flange to Back
3/8”	1 7/8”	1 ¾”

2.06 THERMOPLASTIC PARKING SYMBOL

A. Unless otherwise herein specified, all materials of construction shall comply with Section B, "Materials and Methods of Construction".

B. The Preformed Markings shall be capable of adhering to asphaltic concrete and cement concrete pavements by means of heat fusion without preheating the surface for materials. Adhesives, primers or sealers shall not be used prior to applying preformed markings on asphalt pavements. For concrete pavement, adhesives, primers, or sealers shall only be applied as recommended by the manufacturer to enhance adherence. They shall be very durable, oil and grease impervious and provide immediate and continuing retro reflectivity.

C. The graphic shall be a thermoplastic compound that is prefabricated and installed on site and shall contain a minimum of 30% glass beads as part of the aggregate in the material to act as the basic reflective material. Hot tape products are not acceptable. The graphics shall be in colors as shown on the drawings and shall be manufactured by Surface Signs of New York, Rego Park, NY, or approved equal.

a. A.D.A. Parking Symbol: Shall consist of a solid three-foot (3’) by four-foot (4’) rectangular shaped background with a 32” inch wheelchair symbol as shown on the drawings.

b. A.D.A. Route Symbol: Shall consist of a solid 1-foot (1') by two-foot (2') bullet shaped background with a 7 ½" inch wheelchair symbol and three-quarter inch wide directional arrows as shown on the drawings.
c. Colors for Symbols/lines shall be as follows (unless otherwise shown on the drawings):
   Background - Aqua blue
   Wheelchair Symbol – white
   Directional Arrow – white

D. The thermoplastic material shall be 100% virgin stock, using no reprocessed materials. Pigments, beads and filler shall be uniformly dispersed in the resin. The material shall be free of all skins, dirt and foreign materials.

E. The manufacturer has the option of formulating the thermoplastic material according to their own specifications. However, the product(s) must meet the minimum requirements specified herein.

F. The thermoplastic graphics shall be of an alkyd type and the material shall consist of the following:

20% - Bonding Agent (Minimum)
35% - Titanium and white filler
10% - White sand
30% - Glass Beads (Minimum)

G. The following physical specifications shall be strictly adhered to:

a. The Contractor shall furnish a laboratory report of the material, consisting of the following tests:

i.	Color Retention		ASTM D620-57T
ii.	Indentation		ASTM D2240-68
iii.	Flexibility		ASTM D747
iv.	Binder Content		ASTM D4797
v.	Titanium Dioxide Content	X-Ray Fluorescence	ASTM D476 - Type 2
vi.	Glass Beads		ASTM D1155
vii.	Condition of Wetness		ASTM E2177
viii.	Condition of Continuous Wetness		ASTM E2176

b. Color Retention: The retention of the initial color shall be determined as follows:

   i. Specimens shall be prepared and tested from samples submitted in accordance with ASTM designation D620-57T, "Tentative method of test for color fastness of plastic; Ultra Violet Light and Condensate Exposure, ASTM G53, 300 hours total, alternate four (4) hours condensate exposure at 40 deg.C, four (4) hours UV exposure at 60 deg. C.

c. Indentation Resistance: The reading of the shore durometer, Type A2, as described in ASTM designation D2240-68, after fifteen seconds shall not be less than 95 when the material is tested after heating for four hours at 400 deg. F, and cooled at 75 deg. F.

d. Cracking Resistance: At low temperatures after heating the thermoplastic material for four (4) hours at 218 deg. C (425 deg. F), applied and cooled to -9.4 +/-1.7 deg. C (15 +/-3 deg. F) the thermoplastic material shall show no sign of cracking or chipping.

e. Glass beads: The glass spheres shall be colorless, clean, transparent, free from milkiness or excessive air bubbles and essentially clean from surface scarring or scratching. They shall be spherical in shape and at least 70% of the glass beads shall be true spheres when tested in accordance with ASTM D1155. The refractive index of the spheres shall be a minimum of 1.50 as determined by the liquid immersion method at 25 deg. C.

f. General Characteristics: The thermoplastic material shall be readily applicable at temperatures between 200 & 250 deg. F from the approved equipment to produce graphics and symbols of the required thickness as described in the contract document. The thermoplastic material shall not deteriorate or discolor when held at the application temperature.

g. The compound shall not deteriorate by contact with sodium chloride, calcium chloride, or other chemicals used against formation of ice on roadways or streets, or because of the oil content of pavement materials, or from oil droppings from traffic. Deposits of dirt, tar, road material, tires, or other foreign material shall not adhere to the installed line. The line shall not blacken or discolor after vehicles pass over the line.

h. Other Requirements: Thermoplastic material shall not emit fumes that are toxic or injurious to persons or property when it is heated to application temperature. The material shall not emit excessive smoke during heating or application.

2.07 FLOW TEST EQUIPMENT

A. Provide hydrant flow test equipment including:
   1. 2.5” to 3” DIA. hose and all needed equipment to connect to fire hydrant.
   2. Hydrant diffuser with pitot gauge
   3. Hoses as required for flow control

B. Hydrant diffuser shall:
   1. Be capable of safely dispersing high-velocity discharge
   2. Direct flow to designated drainage areas
   3. Include dechlorination capability where required

C. Acceptable products include:
   1. Hydrant diffuser (Pollardwater LPD-250 Steel Diffuser, or approved equal)

PART 3. EXECUTION

3.01 ASPHALT PAVEMENT

A. Asphaltic pavement shall consist of:

   1. Geotextile for stabilization, required only for sites with poor subgrade.

2. Foundation material for asphalt (Broken Stone) base course;

3. Asphaltic concrete binder course;

4. Tack coat of asphalt emulsion;

5. Asphaltic concrete top course consists of wearing course and leveling course for tennis courts and running tracks

B. Preparation of Subgrade:

1. Excavate to depth shown on Contract Drawings; topsoil, boulders, muck, soft clay, spongy material and any other objectionable material and replace them with broken stone, sand and gravel or other approved fill to promote positive drainage.

2. On sites where it appears that there may be some areas containing objectionable materials, proof roll to locate the unsuitable materials.

3. Exercise care during stripping operations to prevent excessive disturbance to subgrade. Use lightweight dozers or grade-alls for low strength, saturated, noncohesive and low cohesive soils.

4. For extremely soft ground such as peat bog areas, do not over excavate surface materials to take advantage of root mat strength.

5. If vegetation is present, cut at ground surface and place sawdust or sand over stumps and roots extending above ground surface.

6. Scrape and fill subgrades, as necessary, and thoroughly consolidate them to the required lines and grades. Consolidate subgrades for pavements by means of a smooth steel-wheel roller having a nominal gross weight of not less than ten (10) tons, and exerting a minimum force of not less than 300 pounds per inch of width on the compression roll faces, or approved equivalent.

   a. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.

   b. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.

   c. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

7. Compact subgrade to not less than seventy-five (75%) percent relative density as determined by ASTM D2049, or not less than ninety-five (95) percent of the maximum dry density as determined by ASTM D1557, as applicable.

8. In places where the use of a roller is impractical, compact subgrades with hand tampers weighing not less than forty (40) pounds and having a face not exceeding eighty (80) square inches in area.

9. Subgrade must be prepared not less than one hundred (100) feet in advance of the pavement to be immediately constructed.

C. Installation of Geotextile:

1. After subgrade has been prepared, place geotextile in same direction as the new pavement aggregate is being laid down.

2. Do not drag geotextile across subgrade. Place entire roll on subgrade surface and roll out smoothly. Remove wrinkles and folds by stretching and holding down with sandbags as required.

3. Join parallel rolls of geotextile as follows:

California Bearing Ratio (CBR)	Method of Joining
OVER 2	300-450 mm (12-18 in) overlap
1-2	600-900 mm (24-36 in) overlap
0.5-1	900 mm (36 in) overlap or sewn
Less than 0.5	Sewn
All roll ends	900 mm (36 in) overlap or sewn

4. If the CBR of the subgrade is not known, join parallel rolls by sewing them together.

5. For subgrades with CBR less than or equal to 1, where the geotextile is to provide reinforcement, the geotextile shall be pretensioned in the following manner:

   a. Proof roll with heavily loaded, rubber-tired vehicle. Wheel load of truck shall be equivalent to maximum expected for the Site. Vehicle to make at least four (4) passes over first lift in each area of the Site.

b. Once design aggregate has been placed, use pavement prior to paving to prestress geotextile-aggregate system.

6. If required, the geotextile may be held in place prior to subbase placement with sandbags. The use of pins to anchor the geotextile will not be permitted, except at edges of existing pavement as specified below.

7. Do not place overlaps along anticipated primary wheel path locations. Place overlaps at end of rolls in direction of aggregate placement with previous roll on top.

8. When sewn seams are required, strength of seams shall be greater than or equal to eighty (80%) percent of tensile strength of unseamed geotextile as determined by same testing methods.

9. When placing woven geotextile on curves, fold or cut geotextile and overlap in direction of turn with previous fabric on top. Staple or pin folds in geotextile approximately 0.6 m (2 ft) on center.

10. When geotextile intersects an existing pavement area, extend geotextile to edge of old system and anchor it by trenching and covering the edge of the fabric with stone, or staple or pin the fabric to the ground. For widening or intersecting existing pavement where geotextiles have been used, excavate edge of pavement down to existing geotextile and sew the new geotextile to the existing geotextile, or overlap and staple or pin the new fabric to the old and into the ground.

11. Prior to covering, inspect geotextile for excessive damage, including holes, rips and tears.

    a. If excessive defects are observed, repair affected area by placing new layer of geotextile over damaged area.

    b. Extend new layer beyond damaged area the same distance as required for overlap of adjacent rolls.

12. End-dump base aggregate on previously placed aggregate. End dumping or tail-gate dumping of the aggregate directly on the geotextile will not be permitted.

    a. For subgrades with CBR less than or equal to 1, limit pile heights to prevent possible subgrade failure.

    b. Maximum placement thickness for subgrades with CBR less than or equal to 1 shall not exceed design thickness of pavement.

13. Spread and grade first lift of aggregate to 300 mm (12 in) or to design thickness if less than 300 mm (12 in) prior to compaction. Do not allow traffic on soft pavement with less than 200 mm (8 in) of aggregate over geotextile, except 150 mm (6 in) for CBR greater than or equal to 3.

14. Compact the asphaltic concrete binder course as specified in 3.01 B. Vibratory compaction must not be used on the initial lift over the geotextile.

15. Perform construction parallel to pavement alignment.

16. Fill ruts formed during construction to maintain adequate cover over geotextile. Do not blade ruts down.

17. Place remaining base aggregate in lifts not exceeding 250 mm (10 in) in loose thickness and compact to specified density.

18. Equipment may operate on pavement without aggregate for geotextile installation under permeable bases if subgrade is of sufficient strength.

    a. For soils with CBR less than or equal to 0.5, use lightweight construction vehicles for access on first lift.

    b. Limit construction vehicles in size and weight to limit rutting in initial lift to 75 mm (3 in).

    c. If rut depths exceed 75 mm (3 in), decrease construction vehicle size or weight or increase lift thickness.

19. Turning will not be permitted on first lift of base aggregate. Construct turn-outs at pavement edge to facilitate construction.

D. Perform all asphalt Concrete installation in accordance with NYCDOT Section 4.01 Asphaltic Macadam Pavement and 4.02 Asphaltic Concrete Wearing Course.

3.02 ASPHALTIC CONCRETE PAVEMENT WALKS

A. Asphaltic concrete pavement walks shall consist of:

1. Asphaltic concrete binder course (close binder type),

2. Tack coat of asphalt emulsion, and

3. Top course of fine surface mix asphaltic concrete.

B. Asphaltic concrete binder course:

1. Before the asphaltic concrete binder course is laid, compact the subgrade thoroughly, so that the binder course, after compaction, will be found satisfactory when tested by the method given in Paragraph 4, below, and clean it of all loose and foreign material, dry it, and obtain the Engineer's approval.

2. Paint contact surfaces of all curbing, gutters, manholes and adjacent pavement edges with an asphalt emulsion tack coat at the rate of 0.03 to 0.07 gallon per square yard as approved by the Engineer.

3. Set forms, spread and compact the bottom course as specified above for the binder course for asphalt pavement.

4. Provide an asphaltic concrete binder course surface free from depressions exceeding 3/8-inch when tested with a 10-foot straight edge placed parallel with the center line of the walk.

C. Top Course:

1. Clean the binder course of all loose and foreign material before the top course mixture is delivered. Do not lay mixture until the Engineer approves the asphaltic concrete binder course and determines in all cases whether the weather conditions are suitable to permit laying.

2. If at the time of laying the mixture, permanent side supports such as curbs, edging or gutters have not been constructed, fasten in place suitable side forms of wood or steel, true to line and grade. In all cases, adequately support the sides of walks until final compaction is obtained and until the mixture hardens.

3. Spread and compact the top course as specified for the asphaltic concrete binder course .

4. Provide a surface free from depressions exceeding 1/8-inch when measured with a 10-foot straight edge placed parallel with the centerline of the walk.

5. 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 ensure a thorough and continuous bond, as follows:

   a. 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.

   b. Carefully employ hot smoothing irons to heat the old pavement sufficiently (without burning) to insure a proper bond.

6. Paving procedure, including compaction requirements, must be the same as specified above for the top course for asphalt pavement.

3.03 MILLING AND PAVING

A. The Contractor shall be required to grind (mill) and remove a portion of the existing asphaltic top course and granular base to contour the pavement to the required grade, depth, elevations and limits per the Contract drawings.

B. All grinding operations shall be completed using an acceptable milting method, taking care not to damage the pavement to remain and in a manner that prevents dust and other particulate matter from escaping into the air.

C. The average depth of milling shall be 1.5” to 2”, as noted on the Contract Drawings or directed by the Engineer. Where the Contractor exceeds the intended milling depth and/or limits, without prior approval by the Engineer, the Contractor shall restore the roadway to the intended elevation, at no cost to the City. In addition, no payment shall be made for any additional milling made beyond the intended limits.

1. Equipment. All grinding equipment shall be as approved by the Engineer. Any teeth in the milling drum that become dislodged, broken or unevenly worn shall be replaced immediately with teeth of the same length as the remaining teeth in that row.

2. Asbestos Testing. Prior to performing any grinding operations at any site location, the Contractor shall be required to take two 2” diameter pavement core sample of the existing asphaltic concrete wearing course for every 500 square feet of milling, or portion thereof, to be tested for the presence or absence of asbestos by the Contractor’s independent testing laboratory. The exact location of each pavement core sample shall be as directed by the Engineer. This work shall be performed and the test results known to both the Contractor and the Engineer at least two (2) weeks prior to performing milling operations.

   The Contractor’s independent testing laboratory shall be an approved N.Y.S. licensed testing laboratory certified to test for the presence of asbestos in an asphaltic concrete material mix. The testing laboratory shall be required to take immediate chain-of-custody of the core samples as they are taken in the field, transport the samples to their laboratory for testing, and dispose of them at the end of the Work. Under no circumstance shall core samples be taken without the direct supervision of the testing laboratory. The testing laboratory shall then notify both the Contractor and the Engineer of the results.

Should the presence of asbestos be found to exist within the asphalt pavement designated to be removed under this item, the Contractor shall immediately stop all grinding operations until otherwise directed by the Engineer and the limits of asbestos contamination has been determined by subsequent sampling.

No additional payment will be made for this work.

3. Preparation Work. Where new proposed asphaltic concrete pavement is to meet existing asphalt pavement, the Contractor shall saw-cut a joint line in the existing asphaltic wearing course, for a depth of 1-1/2". The joint line shall cross the full width of pavement or where directed by the Engineer. Asphaltic concrete material adjacent to these sawcut lines shall be removed to a depth of 1-1/2" to form a squared out joint for the proposed of keying the new asphalt pavement to the existing asphalt pavement. Rounded transition areas will not be acceptable.

   At all structures the asphaltic concrete material shall be removed for a depth of 1-1/2" by grinding and cutting out the asphaltic material to expose existing frames of existing structures. Any remaining material, within that 1-1/2" depth, around and adhering to structure shall be completely removed by hand and/or hand held cleaning equipment. Rounded transition areas will not be acceptable.

4. Milling (Grinding) Operations. The Contractor shall grind the specified areas down to the required depth and grades in the existing asphaltic concrete wearing course and/or granular base using an acceptable milling and dust control methods and equipment. Care shall be taken to minimize dust pollution and damage to the pavement to remain. For dust control methods and equipment, the Contractor shall employ dust collection and/or watering devices, as approved by the Engineer, without which no milling will be allowed.

   All grindings shall be removed and the remaining surface immediately swept, mechanically, so that the surface of the remaining pavement is free of loose asphaltic concrete, to the satisfaction of the Engineer. The grindings shall be loaded directly into dump trucks and shall be satisfactorily disposed of away from the site as excavated material by the Contractor. Each truck load shall be hand leveled by raking prior to measurement and covering for removal.

   The Contractor shall exercise care during the grinding operations to avoid damaging any concrete base existing beneath the asphaltic wearing course.

3.04 RESTRICTIONS FOR COLOR COATED ASPHALT SURFACES

A. Before the color seal coat system is applied, the asphaltic surface to receive the system shall have cured for a minimum of thirty (30) days. The surface temperature shall be taken using a surface thermometer. The Contractor shall take readings every sixty (60) feet in all

directions. If the average surface temperature is below fifty-five degrees Fahrenheit (55° F.) or expected to be below 55 F degrees within 24 hours, application will not be permitted. If the average surface temperature is above eighty degrees Fahrenheit (80° F.), the surface shall be water fogged before application will be permitted. Application shall not be permitted during rain events or if a rain event is expected within 24 hours.

3.05 INSTALLATION FOR COLOR COATED ASPHALT SURFACES

A. Preparation of Surfaces: The surface shall be cleaned of all dirt, loose sand, and stone. The Contractor shall power wash the surface clean to the satisfaction of the Engineer prior to applying the color seal coat system. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be performed per manufacturer's instructions prior to application of resurfacer coats. Before application of each coat, the surface shall be blown free of all dirt and foreign matter and shall be free from standing water and oils.

B. Application of Materials: All materials shall be mixed at the site unless otherwise permitted by the Engineer. If the Contractor is granted permission to mix any material off the site he shall arrange with the Engineer to have a representative of the Engineer present during the mixing operations. The mixed materials shall be homogeneous, segregation before or during application will not be permitted. All materials shall be applied by approved hand or mechanical squeegees. Each completed application shall be smooth, even textured, free from ridges, valleys and tool marks.

C. Resurfacer Coats: The purpose of the resurfacer coats is to fill the surface voids of the asphalt pavement. To this end the resurfacer coat material shall be applied in multiple coats until the surface of the asphalt is free of voids and no telegraphing of the aggregate in the asphalt is visible. A minimum of two coats shall be applied. However, the Contractor shall apply as many additional coats as may be required to fulfill the above requirements. The resurfacer may be diluted with water in accordance with the manufacturer's Specifications to obtain workability.

The application of the resurfacing coat shall be parallel in one direction of the courts, a second application may be made at ninety degrees 90° to the first coat.

After the first coat of resurfacer is complete, the entire area shall be flooded with water and allowed to drain. Any areas holding over one-sixteenth inch (1/16") (thickness of a nickel) depth of water shall be leveled with a Patching Mix and allowed to thoroughly cure. Patching mix shall be applied in a maximum of (1/4") one-quarter inch lifts. A maximum of (1/2") one-half inch total patch (2 lifts) shall be allowed. This process of water flooding and leveling shall be repeated until all depressions over one-sixteenth (1/16") inch have been eliminated. Surface shall be inspected to ensure all depressions have been filled before application of Intermediate Coats.

D. Intermediate Coats: Three intermediate coats shall be applied. The total amount of material to be applied shall be .10 to .16 gallons per square yard based on the material prior to any dilution. The acrylic resurfacer may be diluted as recommended by the manufacturer to obtain workability.

E. Wearing Coats: One wearing coat shall be applied perpendicular to each other. In the case of tennis court application, the wearing coat shall be applied parallel to the net line. The total amount of material to be applied shall be .18 to .30 gallons per square yard prior to any dilution. The material may be diluted as recommended by the manufacturer to obtain workability. Sand shall not be added to the wearing coats.

F. Line Paint: All painted lines shall be carefully laid out and defined on the surface by chalk markings before being painted.

Two (2) coats of line paint shall be applied. At least two (2) hours shall elapse between the painting of the first and second coats. All painted lines shall be accurately painted within the limits shown on the plans. Lines shall be clear and distinct with sharply defined edges.

3.06 INSTALLATION FOR PAINTED LINES

A. Preparation of Surfaces: Remove all dirt, rust, loose paint, chalk, grease, or oil from the surface to be coated. Surfaces must be clean, dry, and generally smooth. When necessary, surface shall be power washed prior to painting as directed by the Engineer.

B. Layout: Prior to painting, the locations of all lines shall be carefully laid out and defined on the surface by chalk markings. Line widths and dimensions are shown on the drawings.

C. Painting: No Painting shall be done when the temperature is below 55 degrees Fahrenheit or if rain is expected within 24 hours.

Apply one coat of paint accurately within the limits shown on the Plans. All lines shall be clear and distinct with sharply defined edges. Containers and brushes shall be protected in warm weather, since paints dry in 15 minutes. Fresh bituminous surfaces should be allowed to cure for thirty (30) days prior to the application of paint.

D. All new roadway markings, including parking lots and paved areas within NYC Parks property, must be applied in accordance with the New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 6.44 – White and Yellow Thermoplastic Reflectorized Pavement Markings.

E. All roadway markings including crosswalks and thermoplastic lane dividers removed as a result of construction must be replaced in kind to the Standard Details of Construction and the Standard Highway Specifications of the New York City Department of Transportation.

3.07 GUARANTEE INSPECTION

A. Upon completion of the Work in this section, Contractor shall request a Guarantee Inspection from DEP. At the guarantee inspection if the color seal coat is found to be peeling or fading due to improper installation the Contractor shall be responsible to re-apply at its own expense.

3.08 PAVEMENT SAMPLES

A. When required by the Engineer, furnish 4-inch diameter test samples cored from the binder course and from the completed pavement. The Engineer will choose the number of cores and the locations at which the cores shall be taken. Sample cores, when required, shall be taken for every 10,000 square feet of pavement and patch. Density test must show that the sample is within ninety (90%) percent of the laboratory specimen. Replace with new mixture and refinish the areas of pavement so removed without additional compensation.

3.09 PATCHING

A. As directed by Engineer, remove and replace defective areas. Cut such areas and replace with fresh asphaltic concrete and compact to required density.

3.10 CLEANING AND PROTECTION

A. After paving, clear surfaces of excess asphaltic concrete and all foreign matter.

B. Protect new pavement until fully hardened.

C. Cover openings of drainage structures until permanent covers are placed.

3.11 TRAFFIC PAINT PAVEMENT MARKING

A. The Contractor shall furnish and apply hot extruded reflectorized white and/or yellow thermoplastic pavement markings, including glass beads, at the locations and in accordance with contract drawings or as instructed by the Engineer.

B. When pavement markings are applied under traffic the Contractor shall provide all necessary flaggers, signs, and other traffic control devices to maintain and control traffic, per Section 01 55 26 – Traffic Control; to protect the marking operation and the new markings until thoroughly dry. The application of pavement markings shall be done in the general direction of traffic; striping against traffic shall not be allowed.

C. The Contractor shall be responsible for cleaning the pavement to the satisfaction of the Engineer, of dust, dirt and other foreign material that may be detrimental to the adhesion of the paint. At the time of application pavement surfaces shall be thoroughly dry.

D. The thermomoplastic pavement markings shall meet or exceed NYC DOT specification – White and Yellow Thermoplastic Reflectorize Pavement Markings.

E. The paint shall be applied in strict accordance with the manufacturer's recommendations for use. Applied markings shall have clean-cut edges, true and smooth alignment and a minimum uniform wet film thickness of 15 mils. Glass beads shall be applied uniformly over and into the wet paint film at the rate of 6 lbs per gallon of paint.

3.12 THERMOPLASTIC PARKING SYMBOL

A. Thermoplastic graphics are not to be applied below 40 deg. F, or on wet pavements, or during periods of high humidity, except with special permission of the Engineer. Before proceeding to install any graphics, the Contractor shall clean the area of the surface to be marked, and make certain that the pavement is free of dirt, foreign material, oil, etc. Neither the material nor surface shall require preheating in order to achieve the required bond.

B. A.D.A. Symbol shall be placed in locations on the plans.

C. The work included herein shall be done in a neat, professional manner, and shall be aligned correctly. The graphics shall be protected from both vehicular and pedestrian traffic until they are set. Final layout of the graphics shall be approved by the Engineer before heat is applied to make the graphics permanent. The arrow on the A.D.A Route Symbol shall point in the direction of the designated accessible route.

3.13 ADA PARKING SIGN

A. SIGN LOCATIONS

a. Prior to installation, the Contractor shall stake out the location of all signs as shown on the plans. The Contractor shall verify sign locations with Owner prior to installation**.** Signs shall be installed in accordance with ADA Standards for Accessible Design, 28 CFR Part 36, and Section A4.6.4. Accessible parking spaces shall be designated as reserved by a sign showing the symbol of accessibility. Such signs shall be located so they cannot be obscured by a vehicle parked in the space.

B. A.D.A. Signs shall be installed in accordance with the Contract drawings, Standard Details, and as directed by the Engineer, using the specified hardware. Contractor shall supply all necessary mounting brackets, nuts, and bolts to mount the signs on a steel drive rail, existing fence, or other supports as shown on the drawings. All bolts shall be cut and peened after installation is complete.

3.14 HYDRANT FLOW TEST

A. General

1. The Contractor shall:

a. Provide all equipment, materials, and personnel required for testing

b. Coordinate with the Owner, Engineer, and BWS
c. Obtain all necessary permits and hydrant use approvals
d. Notify relevant agencies prior to testing

2. Testing shall be performed in the presence of the Engineer unless waived.

B. PRE-TEST PREPARATION

1. Prior to testing, the Contractor shall:

a. Verify that all gauges and equipment are calibrated
b. Install pressure measuring devices at designated hydrants
c. Confirm system conditions (valves, pumps, operating status)
d. Flush hydrants until clear water is observed

2. Verify discharge routing and confirm that:

a. Flow can be safely conveyed to entire drainage area
b. Storm drainage system can accept test discharge
c. Adjacent properties will not be impacted.

C. TEST PROCEDURE

1. Slowly open hydrant to avoid water hammer
2. Allow flow to stabilize prior to measurement
3. Utilize hydrant diffuser to disperse flow
4. Direct flow along entire drainage area to simulate runoff conditions
5. Adjust diffuser orientation to maintain controlled, non-erosive flow
6. Maintain flow conditions sufficient to evaluate conveyance
7. Observe flow paths toward inlets and drainage structures

D. DISCHARGE CONTROL AND PROTECTION

1. The Contractor shall:

a. Prevent erosion, flooding, and property damage
b. Maintain flow within gutters, curblines, or designated paths
c. Prevent uncontrolled discharge into traffic lanes
d. Provide:
- Sandbags, flow deflectors, or temporary controls as required
- Personnel to monitor and adjust flow conditions

E. WATER QUALITY AND DECHLORINATION

1. Where required by local regulations, provide dechlorination prior to discharge.
2. Dechlorination may be achieved using:

a. Tablet-based diffuser systems
b. Other approved methods

F. DATA COLLECTION AND DOCUMENTATION

1. The Contractor shall record, at a minimum:

   a. Test date, time, and location
   b. Hydrant identification
   c. Static and residual pressures
   d. Flow rate (gpm)
   e. Duration of flow
   f. Observed flow paths and drainage performance

G. POST-TEST REQUIREMENTS

1. After testing, the Contractor shall:

   a. Slowly close hydrants to avoid water hammer
   b. Restore all impacted areas
   c. Remove temporary controls and equipment

2. Submit test report including:

   a. Recorded data
   b. Photographs or video documentation
   c. Summary of drainage performance and deficiencies

3. All applied water shall runoff pavement without any puddle formation or surface runoff. If during testing there is visible ponding, the contractor is responsible for performing any and all restorative measures needed to ensure the asphalt drains as designed.

END OF SECTION

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SECTION 32 12 19.19
POROUS ASPHALT

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Item, the Contractor shall furnish and install POROUS ASPHALT as shown and in accordance with the plans, specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 23 16 – Excavation

B. Section 33 44 31 – Stormwater Membrane Filtration

C. Section 31 05 16 – Aggregates for Earthwork

D. Section 33 05 05.33 – Double Ring Infiltrometer Testing

E. Section 33 42 11 –Stormwater Gravity Piping

1.03 PAYMENT

A. The price bid shall be a Unit price for each SQUARE YARD of POROUS ASPHALT and shall include the cost of all labor, materials, equipment, subgrade preparation, installation of the underlying porous media beds, and porous asphalt mix (mix) design, production, testing and installation, in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. General Porous Asphalt Bituminous Paving and Groundwater Infiltration Beds, specification by UNH Stormwater Center, October, 2009.

B. Design, Construction, and Maintenance Guide for Porous Asphalt Pavements, Information Series 131, National Asphalt Pavement Association (NAPA), November 2008. http://www.asphaltpavement.org/

C. Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115, NAPA, May, 2002. http://www.asphaltpavement.org/

D. Annual Book of ASTM Standards, American Society for Testing and Materials, Philadelphia, PA, 2014 or latest edition. http://www.astm.org/Standard/

E. Standards of the American Association of State Highway and Transportation Officials (AASHTO), 2014 or latest edition. http://www.ihs.com/products/industry-standards/organizations/aashto/index.aspx

F. Section 401- Plant Mix Pavements – General, in Standard Specifications for Road and Bridge Construction – State of New Hampshire Department of Transportation, 2010. http://www.nh.gov/dot/org/projectdevelopment/highwaydesign/specifications/documents/2010_Spec_Book.pdf

G. Section 02725 - General Porous Pavement and Groundwater Infiltration Beds, specification from NAPA Porous Asphalt Seminar handout, Cahill Associates, Inc., 2004.

H. Correlations of Permeability and Grain Size, Russell G. Shepherd, Groundwater 27 (5), 1989.

I. Groundwater, R. Allan Freeze and John A. Cherry, 1979.

J. ASTM C1701/C1701M-17a Standard Test Method for Infiltration Rate of In Place Pervious Concrete

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit working drawings in accordance with the requirements of Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

B. Submit a list of materials proposed for work under this Section including the name and address of the materials producers and the locations from which the materials are to be obtained.

C. Submit certificates, signed by the materials producers and the relevant subcontractors, stating that materials meet or exceed the specified requirements, for review and approval by the Engineer.

D. Submit samples of materials for review and approval by the Engineer. For mix materials, samples may be submitted only to the QA inspector with the Engineer's approval.

E. A Plan illustrating the porous asphalt location overlaid with a grid for infiltration testing during construction, that will be reviewed and approved the Engineer. See Section 1.07 Quality Control for testing requirements.

F. QA/QC submittal requirements for samples and certificates are summarized below:

1. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

2. Codes and Standards - All materials, methods of construction, and workmanship shall conform to applicable requirements of AASHTO, ASTM Standards, NHDOT Standard Specifications for Road and Bridge Construction (or similar state DOT) specifications, latest revised (including supplements and updates), or other standards as specified.

   QC/QA requirements for production of mix are discussed in the Materials section, and for construction of the porous media beds and paving in the Execution section.

3. Table 1 and discussed in further detail in the Materials section.

Table 1. Submittal requirements (UNHSC parameters).

Material or Pavement Course*	Properties to be reported on Certificate**
choker course, reservoir course	gradation, max. wash loss, min. durability index, max. abrasion loss, air voids (reservoir course)
filter course	gradation, permeability/ sat. hydraulic conductivity
filter blanket	gradation
geotextile filter fabric	manufacturer's certification, AOS/EOS, tensile strength
striping paint	certificate
binder	PGAB certification
coarse aggregate	gradation, wear, fracture faces (fractured and elongated)
fine aggregate	gradation,
silicone	manufacturer's certification
Fibers (optional)	manufacturer's certification
mineral filler (optional)	manufacturer's certification
fatty amines (optional anti-strip)	manufacturer's certification
hydrated lime (optional anti-strip)	manufacturer's certification

* Samples of each material shall be submitted to the Engineer (or QA inspector for mix). These samples must be in sufficient volume to perform the standardized tests for each material.
** At a minimum, more material properties may be required (refer to Materials Section).

1.07 QUALITY CONTROL

A. GENERAL

1. QC/QA requirements for Porous Media Bed Construction.

Activity	Schedule
Contractor to notify Engineer for approval	24 hours in advance of start of work

Activity	Schedule
Contractor to employ soil inspector acceptable to Engineer	NA
Contractor to employ staking and layout control inspector acceptable to Engineer	NA
Contractor to employ site grading inspector acceptable to Engineer	NA
Contractor to employ pavement work inspector acceptable to the Engineer	NA
Contractor to notify Engineer for approval	after subgrade preparation, before construction of porous media bed
Contractor to notify Engineer for approval	after filter course placement, before placement of choker course and pavement to verify proper compaction of filter course by ASTM D3385

2. QC/QA for Paving Operations

a. Testing and Inspection: Employ at Contractor's expense an inspection firm acceptable to the Engineer to perform soil inspection services, staking and layout control, and testing and inspection of site grading and pavement work. Inspection and list of tests shall be reviewed and approved in writing by the Engineer prior to starting construction. All test reports must be signed by a licensed Engineer.

b. Test in-place base and surface course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable work as directed by the Engineer.

c. Surface Smoothness: Test finished surface for smoothness using a 3 m (10 foot) straightedge applied parallel with and at right angles to the centerline of the paved area. Surface will not be accepted if gaps or ridges exceed 9.5mm (3/8 inch).

d. Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.

e. QA/QC requirements during paving

Activity	Schedule/Frequency	Tolerance
Inspect truck beds for pooling (draindown)	every truck	NA
Take temp of asphalt in truck	every truck	> 135°C (275°F)
Take temp of PA mix in the paver	each pull	within 6°C (10°F) of the recommended compaction temp
Consult with Engineer to determine locations of butt joints	As needed	NA
Test surface smoothness and positive drainage with a 10' straightedge	After compaction	9.5 mm (3/8")
Consult with Engineer to mark core locations	After compaction	NA
Hose test with at least 5 gpm water	After compaction	immediate infiltration, no puddling

B. INFILTRATION TEST DURING CONSTRUCTION

1. Prior to the start of work, the Contractor must develop for submission a double ring infiltrometer testing grid. One test will be required for every 200 SF of porous pavement proposed. The infiltrometer test must follow Section 33 05 05.33 Double Ring Infiltrometer Testing.

2. Double Ring Infiltrometer Testing shall be completed at each of the following stages, from bottom of the practice to the top:

   a. Establishment of rough grade
   b. Installation of the Choker Course

3. The results of the testing must be provided to the Engineer for review prior to the next stage of work being performed.

C. HYDRANT FLOW TESTING AND FINAL INFILTRATION TESTING

1. Prior to Substantial Completion, the Contractor shall conduct a hydrant flow test and a permeability test of the constructed porous pavement practice.

a. See Section 32 12 16 for requirements of Hydrant Flow Testing.

2. The full permeability of the pavement surface shall be tested by Hydrant Flow Testing.

3. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the City. All applied water shall infiltrate directly without large puddle formation or surface runoff, and shall be observed by the Engineer.

4. All applied water shall infiltrate into the porous asphalt without any puddle formation or surface runoff. If during infiltration testing there is visible ponding or surface runoff, the contractor is responsible for performing any and all restorative measures needed to ensure the porous asphalt meets the infiltration requirements.

5. In addition to hydrant flow testing, one (1) infiltration test shall be conducted for each 500 SF of porous pavement installed. Tests will be conducted in accordance with ASTM C1701 - Infiltration Rate of In Place Pervious Concrete.

6. All porous pavement practices require final acceptance infiltration testing by the Contractor. The Contractor shall be responsible for communication with the Engineer and DEP in advance of scheduled final acceptance infiltration testing.

7. A test fails if the field infiltration rate is materially less than the chemical and physical properties of the porous asphalt submittal, previously approved by the Engineer.

8. If a test fails, a portion or the entire Green Infrastructure practice shall be repaired / cleaned / replaced as directed by the Engineer and DEP and retested at no additional cost to DEP.

D. DENSITY TESTING

1. Prior to Substantial Completion, the Contractor shall conduct density testing of the constructed porous pavement practice. Prior to the start of testing, the Contractor must develop a density testing grid for submission. One test will be required for every 200 SF of proposed porous pavement.

2. The Contractor shall employ a certified density gauge operator from an inspection company approved by the Engineer to perform porous asphalt density testing. The density of the porous asphalt shall be tested using a Troxler Nuclear Density Gauge or approved equal.

3. The density gauge operator shall monitor the in-place density of the porous asphalt to ensure that the pavement is compacted to the Project Target Density (PTD) of between 16%-19% air voids.

4. Testing must be completed in the presence of the Engineer and/or DEP's representative. Results must be provided to DEP within two weeks of testing.

5. If required by DEP, core samples may also be required to determine the density of the constructed porous pavement. All proposed locations for core sampling of porous asphalt must be approved by the Engineer.

E. CONTRACTOR'S MAINTENANCE OBLIGATION

1. Vacuum Cleaning

   a. During the Contractor's guarantee period, the Contractor shall complete vacuum sweeping of the porous asphalt surface a minimum of two (2) times when requested by DEP.

2. The Contractor shall propose an access plan to the Engineer, DEP, and NYC Parks for review and approval prior to Substantial Completion of the site to ensure the vacuum sweeping of the site can be performed. If fence removal or other means of access is required, this will be indicated in the access plan and require prior approval.

3. Vacuum pavement utilizing Elgin Whirlwind Pure Vacuum Sweeper or approved equal.

   a. The vacuum sweeper shall be in proper working condition, meeting the specifications of the manufacturer.

   b. For dust control, pre-wet the area with pressure washer low-pressure nozzle, or do maintenance on rainy day;

   c. Remove coarse debris, stones, and any sediments on the surface with flat head shovel and push broom;

   d. Use a shop-vac to remove standing water and accumulated sediment.

   e. Employ a Billy Goat VQ902SPH wide area lawn vacuum or approved equal to vacuum up loose sediments trapped in pores.

4. Following each vacuum cleaning event, the Contractor shall be responsible for performing a permeability test in accordance with Section 1.07, Part C: Permeability Testing and ASTM C1701 - Infiltration Rate of In Place Pervious Concrete.

PART 2 PRODUCTS

2.01 MATERIALS

A. POROUS MEDIA INFILTRATION BEDS

1. Below the porous asphalt itself (see Figure 1.) are located various layers intended for structure, hydrologic control, and water quality improvement. From top to bottom: a layer of choker course of washed #57 stone, a filter blanket of 3/8" pea gravel and a reservoir course of Washed Clean Aggregate (see Section 31 05 16 – Aggregates for Earthwork), thickness dependent on required storage, desired infiltration, and underlying native materials. The high air void content of the uniformly graded crushed stone reservoir course maximizes storage of filtered water thereby allowing more time for water to infiltrate the native soil below between storms; and creates a capillary barrier that arrests any upwards vertical water movement and in doing so prevents winter freeze-thaw and heaving. The perforated or slotted drain pipe installed in the reservoir course is for hydraulic relief (typically raised off of the bottom of the reservoir stone layer for enhanced groundwater recharge, if no groundwater recharge is desired, pipe is at base of stone or even in a lower section (trench) of stone). Nonwoven geotextile filter fabric (geotextile) (see Section 33 44 31– Stormwater Membrane Filtration) is used **only** for stabilizing the sloping sides of the porous asphalt system excavation and is not to be used on the bottom of the system unless needed for structural reasons. Filter fabrics are not recommended as a horizontal layer between any of the above mentioned layers.

   For high permeability soils (saturated infiltration rate of > 2 inches per hour {5 cm/hr}) where infiltration to groundwater is acceptable, the reservoir course and filter blanket may be unnecessary. In cold regions, the filter blanket should be included to create a capillary barrier to prevent frost heave susceptibility.

2. Material for the choker course and reservoir course shall meet the following:

   Maximum Wash Loss of 0.5%

   Minimum Durability Index of 35

   Maximum Abrasion Loss of 10% for 100 revolutions, and maximum of 50% for 500 revolutions.

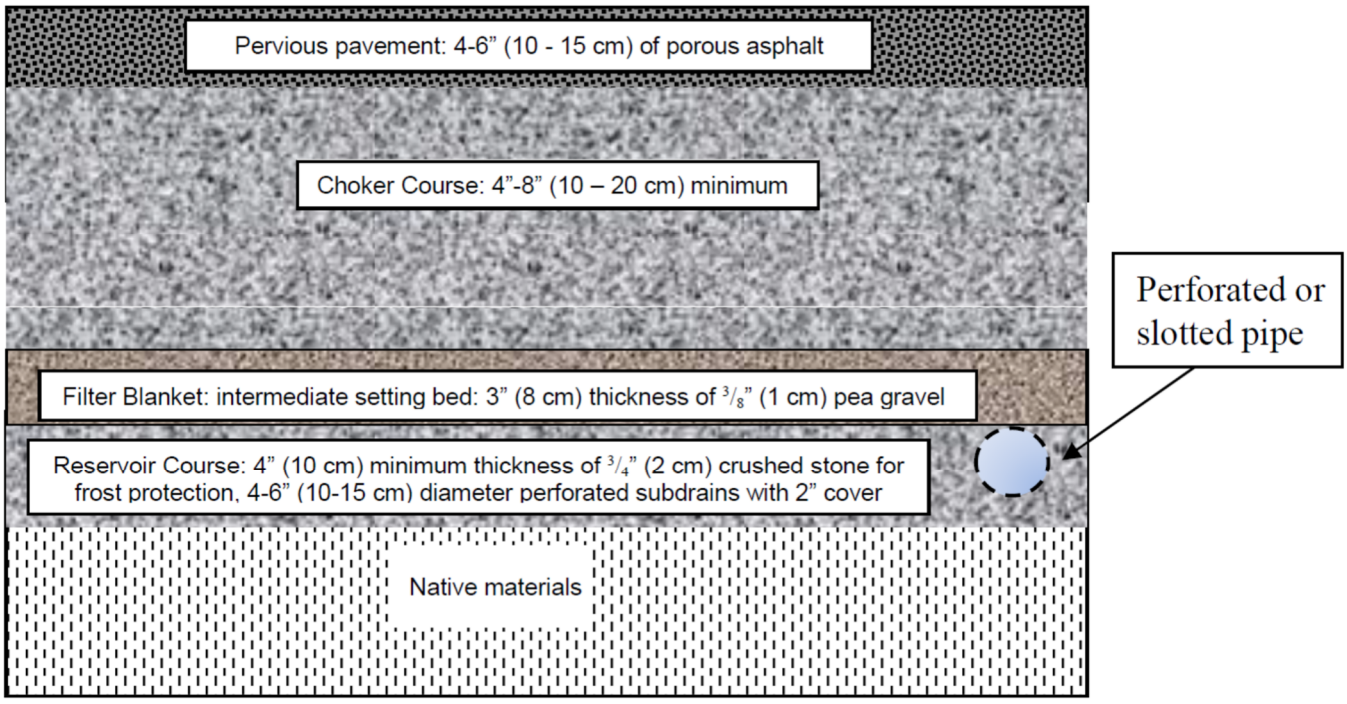


Figure 1 - Porous Asphalt Cross Section

Table 2: Gradations of Choker and Reservoir Course Materials.

US Standard Sieve Size Inches (mm)	Mass Percent Passing (%)	
	Choker Course (AASHTO No. 57No.67)	Reservoir Course (AASHTO No. 3)
2.5(63)		100
2(50)		90-100
1.5 (37.5)	100	35-70
1 (25.0)	95-100	0-15
0.75 (19.0)	--	--
0.5 (12.5)	25-60	0-5
0.375 (9.5)	--	-
#4 (4.75)	0-10	-
#8 (2.36)	0-5	-
% Compaction ASTM D698 / AASHTO T99	95	95

3. The filter blanket material between the choker course and the reservoir course shall be a pea-gravel with a median particle diameter of 3/8" (9.5 mm).

4. Non-woven geotextile filter fabric (**only** recommended for the sloping sides of the porous asphalt system excavation) shall be Mirafi 160N, or approved equivalent and shall conform to the specifications in Table 3. Mirafi ® 160N is a non-woven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. 160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Table 3: Non-woven geotextile filter fabric properties

Mechanical	**Test Method**	**Unit**	**Minimum Average Roll Values**	
			MD*	**CD****
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.71 (160)	0.71 (160)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Shear Strength	ASTM D 4533	kN (lbs)	0.27 (60)	0.27 (60)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2100 (305)	2100 (305)
Puncture Strength	ASTM D 4833	kN (lbs)	0.42 (95)	0.42 (95)
Apparent Opening Size (AOS)	ASTM D 4751	mm (US Sieve)	0.212 (70)	0.212 (70)
Permittivity	ASTM D 4491	sec-1	1.4	1.4
Permeability	ASTM D 4491	cm/sec	0.22	0.22
Flow Rate	ASTM D 4491	lpm/m2 (gpm/ft2)	4,477 (110)	4,477 (110)
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	70

Physical Properties	**Test Method**	**Unit**	**Typical Value**
Weight	ASTM D 5261	g/m2 (oz/yd2)	217 (6.4)
Thickness	ASTM D 5199	mm (mils)	1.9 (75)
Roll dimension (width x length)		m (ft)	4.5 x 91 (15 x 300)
Roll Area		m2 (yd2)	410 (500)
Estimated roll weight		kg (lb)	99 (217)

*MD - Machine Direction; **CD - Cross-machine Direction

B. Porous Asphalt Mix

1. Mix materials consist of performance grade asphalt binder (PGAB), coarse and fine aggregates, and optional additives such as polymer modified asphalt (PMA), fibers, or other select additives. Materials shall meet the requirements of the NAPA's Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115 (2002) and Design, Construction, and Maintenance Guide for Porous Asphalt Pavements, Information Series 131, except where noted otherwise below or approved in writing by the Engineer.

2. Polymer Modified PGAB The asphalt binder shall be a polymer and/or fiber modified performance grade asphalt binder (PGAB) used in the production of Superpave Hot Mix Asphalt (HMA) mixtures. Ideally for maximum durability, the PGAB shall be two grades stiffer than that required for dense mix asphalt (DMA) parking lot installations, which is often achieved by adding a polymer and/or fiber. In New Hampshire the standard DMA asphalt binder is PG 64 -28, meaning that the preferred asphalt binder for porous asphalt applications is PG 76 -22. The PGAB polymer modifiers are to be either styrene butadiene rubber (SBR) or styrene butadiene styrene (SBS). SBS is generally reserved for large projects as pre-blending is required. SBR is feasible for smaller projects as it can be blended at the plant. The dosage of fiber additives shall be added at 1.5% by total mixture volume. Fibers are a simple addition either manually for a batch plant or automated for larger plants. The binder shall meet the requirements of AASHTO M320.

   The PGAB may be pre-blended or post-blended. The pre-blended binder can be blended at the source or at a terminal. For post-blended addition, the modifier can either be in-line blended or injected into the pugmill at the Plant.

   The following asphalt mix designs are recommended (listed in order of increasing strength):

   a. PG 64-28 with 5 pounds of fibers per ton of asphalt mix. This mix is no longer considered suitable for PA wearing course applications in any development. It may be used as a base course where approved by the Engineer for smaller projects with lower traffic counts or loading potential.

   b. Post-Blended PG 64-28 SBR (to effectively obtain PG 76 -22*) at 1.5% by volume with 5 pounds of fibers per ton of asphalt mix. This mix is recommended for large projects > 1acre where high durability pavements are needed. The SBR will be supplied by an approved PGAB supplier holding a Quality Control Plan approved by the state DOT. A Bill of Lading (BOL) will be delivered with each transport of PG 64-28 SBR. A copy of the BOL will be furnished to the QA inspector at the Plant. A Post-Blended SBR Binder Quality Control Plan (Table 4) will be submitted to the Engineer for approval at least 10 working days prior to production.

   **It is noted that with post-blended SBR blends performance grade is assumed as it is impossible to be determined.*

c. Pre-Blended PG 76-28 modified with SBS (this mix has been used with great success since 2011 in New England). This mix is recommended for large sites anticipating high wheel load (H-20) and traffic counts for maximum durability. The SBS will be supplied by an approved PGAB supplier holding a Quality Control Plan approved by the state DOT. A Bill of Lading (BOL) will be delivered with each transport of PG 76-28 SBS. A copy of the BOL will be furnished to the QA inspector at the Plant.

Quality control plans may always be altered at the discretion of the Engineer and based on feasible testing as suggested by the asphalt producer. Certain QC testing requirements during production may not be feasible for small projects in which limited asphalt is generated. Some testing methods cannot be completed during the time needed during small batch (less than approximately 50 tons of porous asphalt mix) production. The feasibility should be assessed with the Engineer and producer.

Table 4: Post-Blended SBS/SBR Binder QC Plan requirements.

The QC Plan* will Contain

1. Company name and address
2. Plant location and address
3. Type of facility
4. Contact information for the Quality Control Plan Administrator
5. QC test to be performed on each PGAB
6. Name(s) of QC testing lab to perform PC and process control testing
7. Actions to be taken for PGAB and Polymer Modifier in non-compliance
8. List of mechanical controls (requirements below)
9. List of process controls and documentation (requirements below)

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List of Mechanical Controls

1. Liquid Polymer Modifier no-flow alert system with an "alert" located in the control room and automatic documentation of a no flow situation on the printout

2. Provide means of calibrating the liquid Polymer Modifier metering system to a delivery tolerance of 1%

3. A batching tolerance at the end of each day's production must be within 0.5%

4. Mag-flow meter (other metering system may be considered)

5. Method of sampling liquid Polymer Modifier

List of Process Controls and Documentation

1. Printouts of liquid Polymer Modifier and PGAB quantities must be synchronized within 1 minute of each other

2. Polymer Modifier supplier certification showing the percent of Polymer Modifier solids in liquid Polymer Modifier

3. Test results of a lab sample blended with the specified dosage of Polymer Modifier. At a minimum, provide the name of the PGAB and liquid Polymer Modifier suppliers and PGAB information such as grade and lot number and Polymer Modifier product name used for the sample

4. MSDS sheet for liquid Polymer Modifier

5. Handling, storage and usage requirements will be followed as required by the liquid Polymer Modifier manufacturer

6. At a minimum, provide a table showing proposed rate of Polymer Modifier liquid (L/min) in relation to HMA production rate (tons per hour) for the percent solids in liquid Polymer Modifier, quantity of Polymer Modifier specified for HMA production and the specific gravity of the Polymer Modifier

7. QCT or QC plan administrator must be responsible for documenting quantities and ensuring actual use is within tolerances. All printouts, calculations, supplier certifications, etc., must be filed and retained as part of the QCTs daily reports

8. Method and frequency of testing at the HMA plant including initial testing and specification testing

***This plan shall be submitted to the Engineer 10 days before production.**

3. Anti-Stripping Mix Additives

The mix shall be tested for moisture susceptibility and asphalt stripping from the aggregate by AASHTO T283, or improved updated method. If the retained tensile strength (TSR) < 80% upon testing, a heat stable additive shall be furnished to improve the anti-stripping properties of the asphalt binder. Test with one freeze-thaw cycle (rather than five recommended in *NAPA IS 115*). The amount and type of additive (e.g. fatty amines or hydrated lime) to be used shall be based on the manufacturer's recommendations, the mix design test results, and shall be approved by the Engineer.

Silicone shall be added to the binder at the rate of 1.5 mL/m3 (1 oz. per 5000 gal).

Fibers may be added per manufacturer and *NAPA IS 115* recommendation if the draindown requirement cannot be met (<0.3% via ASTM D6390) provided that the air void content requirement is met (>18%, or >16% as tested with CoreLok device).

Additives should be added per the relevant DOT specification and *NAPA IS 115*.

4. Coarse Aggregate

Coarse aggregate shall be that part of the aggregate retained on the No. 8 sieve; it shall consist of clean, tough, durable fragments of crushed stone, or crushed gravel of uniform quality throughout.

Coarse aggregate shall be crushed stone or crushed gravel and shall have a percentage of wear as determined by AASHTO T96 of not more than 40 percent. In the mixture, at least 75 percent, by mass (weight), of the material coarser than the 4.75 mm (No. 4) sieve shall have at least two fractured faces, and 90 percent shall have one or more fractured faces (ASTM D5821). Coarse aggregate shall be free from clay balls, organic matter, deleterious substances, and not more than 8.0% of flat or elongated pieces (>3:1) as specified in ASTM D4791.

5. Fine Aggregate

The fine aggregate shall be that part of the aggregate mixture passing the No. 8 sieve and shall consist of sand, screenings, or combination thereof with uniform quality throughout. Fine aggregate shall consist of durable particles, free from injurious foreign matter. Screenings shall be of the same or similar materials as specified for coarse aggregate. The plasticity index of that part of the fine aggregate passing the No. 40 sieve shall be not more than 6 when tested in accordance with AASHTO T90. Fine aggregate from the total mixture shall meet plasticity requirements.

6. Recycled Asphalt (RAP)

Recycled asphalt can be used to supplement, or in place of, fine aggregate. RAP should be a ½" minus or properly managed product with known asphalt content in quantities not to exceed more that 10% by weight.

7. Porous Asphalt Mix Design

The Contractor shall submit a mix design at least 10 working days prior to the beginning of production. The Contractor shall make available samples of coarse aggregate, fine aggregate, RAP, fibers and a sample of the PGAB that will be used in the design of the mixture. A certificate of analysis (COA) of the PGAB will be submitted with the mix design. The COA will be certified by a laboratory meeting the requirements of AASHTO R18. The Laboratory will be certified by the state DOT, regional equivalent (e.g. NETTCP), and/or qualified under ASTM D3666. Technicians will be certified by the regional certification agency (e.g. NETTCP) in the discipline of HMA Plant Technician.

The mixture will be designed according to the NAPA IS 131, with the exception of testing for air void content. Bulk specific gravity (SG) used in air void content calculations shall not be determined and results will not be accepted using AASHTO T166 (saturated surface dry), since it is not intended for open graded specimens (>10% AV). Bulk SG shall be calculated using AASHTO T275 (paraffin wax) or ASTM D6752 (automatic vacuum sealing, e.g. CoreLok). Air void content shall be calculated from the bulk SG and maximum theoretical SG (AASHTO T209) using ASTM D3203.

The materials shall be combined and graded to meet the composition limits by mass (weight) as shown in Table 5.

8. Porous Asphalt Mix Production

a. Mixing Plants. Mixing plants shall meet the requirements of hot mix asphalt plants as specified in the state DOT or regional equivalent unless otherwise approved by the Engineer (e.g. *Section 401- Plant Mix Pavements – General for Quality Assurance specifications* in the *Standard Specifications for Road and Bridge Construction* – State of New Hampshire DOT, 2010, or latest revised edition and including supplemental specifications and updates).

Table 5. Porous Asphalt Mix Design Criteria

Sieve Size (inch/mm)	Percent Passing (%)
0.75/19	100
0.50/12.5	85-100
0.375/9.5	55-75
No.4/4.75	10-25
No.8/2.36	5-12
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	5.8 - 6.5%
Air Void Content (ASTM D6752)	16.0-22.0%
Draindown (ASTM D6390)*	< 0.3 %
Retained Tensile Strength (AASHTO 283)**	> 80 %
Cantabro abrasion test on unaged samples	< 20%
Cantabro abrasion test on 7 day aged samples	< 30%

* Either method is acceptable

**Cellulose, mineral, or polyester fibers may be used to reduce draindown.

***If the TSR (retained tensile strength) values fall below 80% when tested per NAPA IS 131 (with a single freeze thaw cycle rather than 5), then in Step 4, the contractor shall employ an antistrip additive, such as hydrated lime (ASTM C977) or a fatty amine, to raise the TSR value above 80%.

b. Preparation of Asphalt Binder. The asphalt material shall be heated to the temperature specified in the state DOT specification (if using a DOT spec for the mix) in a manner that will avoid local overheating. A continuous supply of asphalt material shall be furnished to the mixer at a uniform temperature.

c. Preparation of Aggregates. The aggregate for the mixture shall be dried and heated at the mixing plant before being placed in the mixer. Flames used for drying and heating shall be properly adjusted to avoid damaging the aggregate and depositing soot or unburned fuel on the aggregate.

Mineral filler, if required to meet the grading requirements, shall be added in a manner approved by the Engineer after the aggregates have passed through the dryer.

The above preparation of aggregates does not apply for drum-mix plants.

d. Mixing. The dried aggregate shall be combined in the mixer in the amount of each fraction of aggregate required to meet the job-mix formula and thoroughly mixed prior to adding the asphalt material.

The dried aggregates shall be combined with the asphalt material in such a manner as to produce a mixture that when discharged from the pugmill is at a target temperature in the range that corresponds to a recommended range supplied by the PGAB supplier.

The asphalt material shall be measured or gauged and introduced into the mixer in the quantity determined by the Engineer for the particular material being used and at the temperature specified in the relevant specification.

After the required quantity of aggregate and asphalt material has been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt material throughout the aggregate is secured and there is no residual moisture in the coated aggregate.

All plants shall have a positive means of eliminating oversized and foreign material from being incorporated into the mixer.

e. QC During Production

The Contractor shall provide process control and/or QC test results to the Engineer or the Engineer's designee. The QC plan may be altered at the discretion of the Engineer and based on feasible testing as suggested by the asphalt producer. Certain QC testing requirements during production may not be feasible for small projects in which limited asphalt is generated. Some testing methods cannot be completed during the time needed during small batch production. The feasibility should be assessed with the Engineer and producer.

The mixing plant shall employ a Quality Control Technician (QCT). The QCT will perform QC testing and will be certified in the discipline of HMA Plant Technician by the relevant certifying agency (e.g. NETTCP in New England). The Contractor shall sample, test and evaluate the mix in accordance with the methods and minimum frequencies in Table 6 and the Post-Blended SBR Binder Quality Control Plan (if applicable).

Table 6: QC/QA testing requirements during production**.**

Test	Min. Frequency	Test Method
Temperature in truck at plant	6 times per day	
Gradation	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T30
Binder Content	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T164
Air Void Content	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	ASTM D6752
Binder Draindown	Greater of either (a) 1 per 500 tons, (b) 1 per day, or (c) 1 per job	ASTM D6390

If an analyzed sample is outside the testing tolerances immediate corrective action will be taken by the contractor. After the corrective action has been taken the resulting mix will be sampled and tested. If the re-sampled mix test values are outside the tolerances the Engineer will be immediately informed. The Engineer may determine that it is in the best interest of the project that production is ceased. The Contractor will be responsible for all mix produced for the project.

f. Testing Tolerances During Production. Testing of the QC requirements shall be within the limits set in Table 6. The paving mixture produced should not vary from the design criteria for aggregate gradation and binder content by more than the tolerances in Table 7.

Table 7: QC/QA testing tolerances during production.

Sieve Size (inch/mm)	Percent Passing
0.75/19	-
0.5/12.5	± 6.0
0.375/9.5	± 6.0
0.187/4.75	± 5.0
0.093/2.36	± 4.0
0.0029/0.075	± 2.0
% PGAB	± 0.3

g. Plant Shutdown and Rejection of Mix. Should the porous asphalt mix not meet the tolerances specified in this section upon repeat testing, the Engineer may reject further loads of mix. Mix that is loaded into trucks during the time that the plant is changing operations to comply with a failed test shall not be accepted and should be recycled at the plant.

9. Striping Paint shall be latex, water-base emulsion, ready-mixed, and complying with pavement marking specifications PS TT-P-1952.

PART 3 EXECUTION

3.01 INSTALLATION

A. Protection of Existing Improvements

1. Protect adjacent work from the unintended dispersal/splashing of pavement materials. Remove all stains from exposed surfaces of pavement, structures, and grounds. Remove all waste and spillage. If necessary, limit access to adjacent work/structures with appropriate signage and/or barriers.

B. Weather Limitations

1. Porous asphalt, Open graded friction course, or dense-mixed asphalt shall not be placed between November 15 and March 15, or when the ambient air temperature at the pavement site in the shade away from artificial heat is below 16 °C (60 °F) or when the actual ground temperature is below 10 °C (50 °F). Only the Engineer may adjust the air temperature requirement or extend the dates of the pavement season.

2. The Contractor shall not pave on days when rain is forecast for the day, unless a change in the weather results in favorable conditions as determined by the Engineer.

C. Porous Media Beds

3. Grade Control

a. Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks, and free of puddle-forming low spots. All areas must drain freely. Excavation elevations should be within +/- 0.1 ft (+/- 3 cm).

b. If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

c. General criteria for watershed area to treatment area ratios for permeable pavements are defined by the state. Hybrid designs (dense-mix drive-lanes with permeable pavement parking stalls) have been used to address diminished strength of permeable asphalt materials in high traffic volume/load locations. A 1:1 watershed area to permeable pavement area is preferred (implying no runon). Improvements to materials and designs have addressed many of the strength deficiencies associated with older designs and materials specifications.

4. Notification

The Engineer shall be notified at least 24 hours prior to all porous media bed and porous pavement work.

5. Subgrade preparation

a. The existing native subgrade material under all bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to stone bed placement. Compaction is acceptable if an impermeable liner is used at the base of the porous asphalt system and infiltration is not desired.

b. Where erosion of the native material subgrade has caused accumulation of fine materials and/or surface ponding at the base of the excavation, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches (15 cm) with a York rake or equivalent and light tractor.

c. Bring subgrade of stone porous media bed to line, grade, and elevations indicated. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of the stone. All bed bottoms are level grade to promote uniform infiltration.

6. Porous Media Bed Installation

a. Upon completion of subgrade work, the Engineer shall be notified and shall inspect at his/her discretion before proceeding with the porous media bed installation.

b. Side slope geotextile (when used) and porous media bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of geotextile or porous media at no extra cost to the Owner.

c. Place side slope geotextile in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of sixteen inches (16" or 41 cm). Secure geotextile at least four feet (1.2 m) outside of the bed excavation and take any steps necessary to prevent any runoff or sediment from entering the storage bed.

d. Install coarse aggregate in lifts no greater than 8-inches (20 cm). Lightly compact each lift with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades indicated on the drawings.

e. Install choker base course (see Materials section) aggregate evenly over surface of filter blanket bed, sufficient to allow placement of pavement, and notify Engineer for approval. Choker base course thickness shall be sufficient to allow for even placement of the porous asphalt but no less than 4-inches (10 cm) in depth.

7. Resurfacing

In cases where a porous asphalt system was constructed and the asphalt needs to be replaced, it is recommended to mill the older asphalt and to resurface on the choker course rather than to use a tackifier and pave over the older asphalt. While there is little documented experience with partial milling and resurfacing it has been done with success for porous asphalt pavements. Attention to cleaning milled surface is critical.

a. Mill older asphalt down to specified depth or to choker course

b. Restore the infiltration capacity with low angle pressure washing or air to a vacuum (for example, the 15" vacuum attachment hose of a Tymco regenerative air vac or approved equal)

c. Level and compact choker course

8. Porous Asphalt Pavement Installation

a. The mixing plant, hauling and placing equipment, and construction methods shall be in conformance with NAPA IS 131 and applicable sections of the state DOT's specification for asphalt mixes.

b. The use of surge bins shall not be permitted.

c. Hauling Equipment. The open graded mix shall be transported in clean vehicles with tight, smooth dump beds that have been sprayed with a non-petroleum release agent or soap solution to prevent the mixture from adhering to the dump bodies. Mineral filler, fine aggregate, slag dust, etc. shall not be used to dust truck beds. The open graded mix shall be covered during transportation with a suitable material of such size sufficient to protect the mix from the weather and also minimize mix cooling and the prevention of lumps. When necessary, to ensure the delivery of material at the specified temperature, truck bodies shall be insulated, and covers shall be securely fastened. Long hauls, particularly those in excess of 25 miles (40 km), may result in separation of the mix and its rejection.

d. Placing Equipment. The paver shall be a self-propelled unit with an activated screed or strike-off assembly, capable of being heated if necessary and capable of

spreading and finishing the mixture without segregation for the widths and thicknesses required. In general, track pavers have proved superior for Porous Asphalt placement. The screed shall be adjustable to provide the desired cross-sectional shape. The finished surface shall be of uniform texture and evenness and shall not show any indication of tearing, shoving, or pulling of the mixture. The machine shall, at all times, be in good mechanical condition and shall be operated by competent personnel.

Pavers shall be equipped with the necessary attachments, designed to operate electronically, for controlling the grade of the finished surface.

The adjustments and attachments of the paver will be checked and approved by the Engineer before placement of asphalt material.

e. Rollers. Rollers shall be in good mechanical condition, operated by competent personnel, capable of reversing without backlash, and operated at speeds slow enough to avoid displacement of the asphalt mixture. The mass (weight) of the rollers shall be sufficient to compact the mixture to the required density without crushing of the aggregate. Rollers shall be equipped with tanks and sprinkling bars for wetting the rolls.

   Rollers shall be two-axle tandem rollers with a gross mass (weight) of not less than 7 metric tons (8 tons) and not more than 10 metric tons (12 tons) and shall be capable of providing a minimum compactive effort of 44 kN/m (250 pounds per inch) of width of the drive roll. All rolls shall be at least 1.1 m (42 inches) in diameter.

   A rubber tired roller is not required on the open graded asphalt friction course surface.

f. Conditioning of Existing Surface. Contact surfaces such as curbing, gutters, and manholes shall be painted with a thin, uniform coat of Type RS-1, or equivalent emulsified asphalt immediately before the asphalt mixture is placed against them.

g. Temperature Requirements. The temperature of the asphalt mixture, at the time of discharge from the haul vehicle and at the paver, shall be between 135-163°C (275 to 325°F), within 6 °C (10 °F) of the compaction temperature for the approved mix design.

h. Spreading and Finishing. The Porous Asphalt should be placed in two lifts at 1.5 to 2 inches (4 - 6 cm). One lift is not recommended because uniform compaction is difficult to achieve. Great care must be taken to insure that the porous asphalt layers join completely. This means: keeping the time between layer placements minimal; keeping the first layer clear from dust and moisture, and minimizing traffic on the first layer. However care should be taken to allow sufficient time for the asphalt placement to set, generally the following day or when the surface temperature of the first lift cools to 38°C (100 °F). Two lifts affords better

compaction of the entire lift, especially in colder weather and for large sites. It also provides access to the site for finish work such as curbing. Care must be taken to not damage or impair permeability of the base course if a multiple lift scenario is chosen. If significant site work will take place between placement of base and wearing courses higher durability mixes should be used for both layers.

The Contractor shall protect all exposed surfaces that are not to be treated from damage during all phases of the pavement operation.

The asphalt mixture shall be spread and finished with the specified equipment. The mixture shall be struck off in a uniform layer to the full width required and of such depth that each course, when compacted, has the required thickness and conforms to the grade and elevation specified. Pavers shall be used to distribute the mixture over the entire width or over such partial width as practical. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture shall be spread and raked by hand tools.

No material shall be produced so late in the day as to prohibit the completion of spreading and compaction of the mixture during daylight hours, unless night paving has been approved and established for the project.

No traffic will be permitted on material placed until the material has been thoroughly compacted and has been permitted to cool to below 38 °C (100 °F). The use of water to cool the pavement is not permitted. The Engineer reserves the right to require that all work adjacent to the pavement, such as guardrail, cleanup, and turf establishment, is completed prior to placing the wearing course when this work could cause damage to the pavement. On projects where traffic is to be maintained, the Contractor shall schedule daily pavement operations so that at the end of each working day all travel lanes of the roadway on which work is being performed are paved to the same limits.

i. Compaction. Immediately after the asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The compaction objective is 16% - 19% in place void content (Corelock).

   Breakdown rolling shall occur when the mix temperature is between 135-163°C (275 to 325°F). This is typically achieved with 1-2 passes with a 7.5 – 10 ton vibratory roller.

   Finish rolling shall occur when the mix temperature is between 66-93°C (150 to 200°F). This is typically achieved with a 1-ton roller with no vibratory compaction. Finish rolling is largely aesthetic and done for a smooth finished surface. Care should be taken so as to not continually roll the same location for instance back and forth to a water source.

The cessation temperature occurs at approximately 79°C (175°F), at which point the mix becomes resistant to compaction. If compaction has not been performed at temperatures greater than the cessation temperature, the pavement will not achieve adequate durability. The temperatures referenced here are guidelines and have been used in the field to oversee successful porous asphalt installations.

The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

Rollers or oscillating vibratory rollers, ranging from 7.5 – 10 tons, shall be used for breakdown compaction. The number, mass (weight), and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. Generally, one breakdown roller will be needed for each paver used in the spreading operation.

To prevent adhesion of the mixture to the rollers, rollers shall be kept moist with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot or lightly oiled hand tampers, smoothing irons or with mechanical tampers. On depressed areas, either a trench roller or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Other combinations of rollers and/or methods of compacting may be used if approved in writing by the Engineer, provided the compaction requirements are met.

The speed of the roller shall be slow and uniform to avoid displacement of the mixture, and the roller should be kept in as continuous operation as practical. Finish rolling shall continue below the threshold temperature until all roller marks and ridges have been eliminated.

Rollers will not be stopped or parked on the freshly placed porous asphalt.

It shall be the responsibility of the Contractor to conduct whatever process control the Contractor deems necessary. Acceptance testing will be conducted by the Engineer using cores provided by the Contractor.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture. The mixture shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of binder shall be removed and replaced. These replacements shall be at the Contractor’s expense.

If the Engineer determines that unsatisfactory compaction or surface distortion is being obtained or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment and proceed with the work in accordance with the sixth paragraph of this subsection.

j. Joints. Joints between old and new pavements or between successive day's work shall be made to ensure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline, at locations approved by the Engineer. The Engineer will determine locations by using a straightedge at least 3 m (10 feet) long. The butt joint shall be thoroughly coated with Type RS-1 or equivalent emulsified asphalt just prior to depositing the pavement mixture when pavement resumes.

Longitudinal joints that have become cold shall be coated with Type RS-1 or equivalent emulsified asphalt before the adjacent mat is placed. If directed by the Engineer, joints shall be cut back to a clean vertical edge prior to applying the emulsion.

k. Surface Tolerances. The surface will be tested by the Engineer using a straightedge at least 3 m (10 feet) in length at selected locations parallel with the centerline. Any variations exceeding 9.5 mm (3/8 inch) between any two contact points shall be satisfactorily eliminated. A straightedge at least 3 m (10 feet) in length may be used on a vertical curve. The straightedges shall be provided by the Contractor.

l. Work shall be done expertly throughout, without staining or injury to other work. Transition to adjacent impervious asphalt pavement shall be merged neatly with flush, clean line. Finished pavement shall be even, without pockets, and graded to elevations shown on drawing.

m. Repair of Damaged Pavement. Any existing pavement on or adjacent to the site that has been damaged as a result of construction work shall be repaired to the satisfaction of the Engineer without additional cost to the City.

n. Striping Paint

    i. Vacuum and clean surface to eliminate loose material and dust.

    ii. Paint striping in accordance with plan layouts. Apply paint with mechanical equipment to produce uniform straight edges. Apply in two coats at manufacturer's recommended rates. Provide clear, sharp lines using specified paint. Paint should conform with Federal Specification TT-P-85.

CONTRACT GI-CONS-7
SECTION 32 12 19.19
POROUS ASPHALT

END OF SECTION

CONTRACT GI – CONS-7
SECTION 32 12 73
ASPHALT PAVING JOINT SEALANTS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall install ASPHALTIC JOINT AND CRACK SEALANT FOR EXISTING PAVEMENTS in accordance with the plans, Specifications, and directions of the Engineer.

B. The rubberized asphalt sealants specified in this section are fast curing, require minimum preparation and may be used in joints or cracks at locations that will be opened immediately for public use.

1.02 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MATERIALS

A. Sealant: The Contractor shall install Type A, Type B or both sealants subject to the approval of the Engineer:

1. Type A-Traditional Hot Poured Sealant: Type A expansion joint sealants shall be hot-poured and must meet the requirements of ASTM Designation D 6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

The sealant is supplied in bricklike form that is heated before application in oil jacketed kettles and then poured into the expansion joints. Expansion joint material is a polymer modified asphalt emulsion horizontal joint sealant. Sealant is a single component, hot– applied, self-leveling material that is poured into the expansion

joint slot. The sealant shall be capable of curing tack-free within two hours. Type A sealant shall be similar to:

a. "SealTight Hi-Spec" polymeric joint sealant as manufactured by W.R Meadows, Inc., York, PA; or Allied Building Products, East Rutherford, NJ; or Strober Bros., Brooklyn, NY; or approved equal

   Or

b. "Crackrite Direct Fire" polymer modified joint sealant as manufactured by The Pavement Depot, Inc., Cheshire, CT, or approved equal.

   Joint sealant shall be homogeneous and free from water. It shall not foam when heated to 350° F.

2. Type B-Torch Heated Rope-Like Sealant: The sealant is supplied in ropelike form of various diameters. The material is placed into the expansion joint and then melted after placement.

   The sealant is a direct heat, rubberized, crack and joint sealant consisting of asphalt cement modified with 100% SEBS polymer rubber, plasticizers and stabilizers. The sealant is furnished as an elastic rope in 1/4", 1/2" and 3/4" diameter configurations. Sealant shall be an elastomeric, self-leveling sealant, which liquefies when direct heat is applied and must meet requirements of ASTM C920 Standard Specification for Elastomeric Joint Sealants Type S, T1. Type B sealant shall be similar to "CRACK-STIX" as manufactured by Dalton Enterprises, Inc., Cheshire, CT, or approved equal. Cold applied sealants will not be acceptable.

TYPE B SEALANT DETAIL CHART

PHYSICAL PROPERTIES	TEST RESULTS
Cone penetration @ 77^0 F 150g., 5S	35-45
Resilience @ 77^0 F (ASTM D-3407)	70%
Flow @ 140^0 F	0 mm
Asphalt Compatibility (ASTM D 3407)	Pass
Softening point (ASTM D36)	210^0 F

Ductility 39.2^0 F (ASTM D113)	40 cm
Elongation	1800%
Drying Time (traffic ready)	20 minutes
Polymer Rubber	10%-15% wt./vol.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall remove loose materials and foreign matter that impair adhesion of joint sealant. Ensure structurally sound surfaces. Joints and pavement surface shall be swept clean and all loose particles shall be blown out of the joint immediately preceding the sealing operation. Cracks or joints over one (1") inch in depth shall be pre- filled with a bond breaker or a backer rod. Backer rod should be 25% wider than crack so that it does not slip down or float out of crack after installation of sealant.

3.02 TYPE A SEALANT

A. The Contractor shall clean out joints by routing, grinding, sandblasting, wire brushing or mechanical abrading to a minimum depth of one half (1/2") inch. Clean joints to expose a sound surface free of contamination. Debris shall be blown out of the joint with oil-free compressed air immediately preceding the sealing operation. Joints one (1") inch depth, shall be filled with a closed-cell, heat-resistant backer rod similar to CERA-ROD Catalog No. 790, as manufactured by Strober Bros., Brooklyn, NY, or approved equal.

Apply materials in accordance with manufacturer's recommendations; take care to produce beads of proper width and depth, tool as recommended by manufacturer, and immediately remove surplus sealant. For hot-poured sealant, the Contractor shall not exceed the maximum allowable heating temperature specified. A thermostatically controlled, portable oil jacketed kettle-applicator similar to Model KERA-10 as manufactured by Marathon Road Equipment Co., Burlington, Ontario, Canada, or approved equal, may be used to melt and apply the sealant. Pour liquefied sealant into joint slot in one direction, flush to top, and allow to flow and level out as necessary. Fill joints from bottom up to exterior face by holding properly sized nozzle against joint bottom. Filling joints from bottom to top prevents air voids. Tool lightly to smooth out ripples and to ensure maximum adhesion to joint sides. Dry tool or dampen tool with solvent. Do not use water or soapy water. Remove excess sealant promptly as the work progresses and clean adjacent surfaces. Do not use when surface is wet or when rain is imminent.

3.03 TYPE B SEALANT

A. The Contractor shall clean existing joints using hand tools, (i.e., screwdriver, shovels, metal bars with chisel shaped ends, stiff bristle brooms, wire brushes or scrapers) or power tools (i.e., vertical spindle or rotary type router, backpack blower or oil free compressed air, capable of furnishing (90 PSI) pressure at nozzle. Cracks and pavement surfaces shall be swept/air blown thoroughly clean. Crack/joints over 1" deep should be pre- filled with a non-shrinking, non-absorbent backer rod or clean sand.

The sealant shall be placed and pressed into the joint to 1/16"-1/8" below the pavement surface before it is heated. Cut the appropriate size of CRACK-STIX, or approved equal, for the crack/joint to be sealed (push a screwdriver down on stix on the pavement surface to cut the "stix" to size). Take the cut CRACK-STIX, or approved equal, and push it down into the crack/joint, inch by inch, until it is approximately 1/8" from the top of the surrounding pavement (slight recess for expansion/contraction). When sealing cracks/joints over 3/4" deep, multiple applications of CRACK-STIX, or approved equal, may be necessary to fill crack as specified. Liquefy "stix" completely and let cool before applying additional material.

Pre-warm asphalt/concrete joint prior to application with propane torch, especially when surfaces are damp or below 40° F. Cavity must be totally dry to ensure a positive seal. Exercise caution when heating concrete. Entrapped moisture or frost may cause concrete to "pop" or spall.

3.04 MELTING EQUIPMENT

A. The "stix" shall be completely melted by standard propane torch with narrow flame spread or "CSX-900 Torch," manufactured by Pavement Depot, Inc. or approved equal. Holding flame 1-1/2" from CRACK-STIX, or approved equal, move the flame from side to side in a slow and even motion until the "stix" are completely liquefied. Melting time may vary due to wind, ambient temperature or thickness of "stix." Do not overheat pavement adjacent to crack or joint that is being repaired.

3.05 MATERIAL LIMITATIONS

A. Do not apply CRACK-STIX, or approved equal, in wet cracks or where frost, snow, or ice is present. The pavement temperature shall be above 40°F (4°C) at the time of installation. Application of sealant to damp or improperly cleaned surfaces may result in a low degree of adhesion that can cause the sealant to pull out of the cracks/joints.

3.06 PROTECTION OF AREA

A. The Contractor shall protect the site from pedestrian traffic until sealant cures. Refer to manufacturer's literature for curing times.

B. After the sealant has cured, remove uncured sealant and joint filler with solvent, xylene, toluene, or MEK. Remove cured sealant and joint filler by razor, scraping, or machine.

C. Remove all debris related to application of sealants from job site in accordance with all applicable regulations for hazardous waste disposal.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 14 23
ASPHALT BLOCK PAVING

PART 1. GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall construct ASPHALT BLOCK PAVING in accordance with the plans, specifications, and directions of the Engineer. The joints shall be filled with sand or sand cement grout, as shown on the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 32 12 16 – Asphalt Paving

C. Section 32 12 73 – Asphalt Paving Joint Sealant

1.03 PAYMENT

A. The price bid shall be a unit price per SQUARE FOOT of ASPHALT BLOCK ON STONE SCREENINGS installed, and shall include furnishing all labor, materials, and equipment necessary to prepare the subgrade, furnish and place blocks, stone screenings, and all incidentals necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The layout of the pavers shall be subject to approval by the Engineer. Layout patterns and paver designs are as indicated on the plans. All edges, borders, and corners of the paved area shall be finished to true and neat lines. Special cutting, soldier courses, color patterns, various shapes, and variations in size and finish are all to be included in the square foot price bid.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall furnish two (2) samples of blocks before starting work for approval. Blocks used on the work shall conform to the approved samples in all aspects, in the opinion of the Engineer.

1.07 QUALITY CONTROL (NOT USED)

CONTRACT GI-CONS-7

SECTION 32 14 23

ASPHALT BLOCK PAVING

PART 2. PRODUCTS

2.01 MATERIALS

A. Bituminous Setting Bed: Asphalt cement to be used in the bituminous setting bed shall conform to PGA 64-22, ASTM D6373, Performance Graded Asphalt. The fine aggregate to be used in the bituminous setting bed shall be clean, hard sand with durable particles, free from adherent coatings, lumps of clay, alkali salts, and organic matter. It shall be uniformly graded from coarse to fine, all passing the No. 4 sieve and shall meet the gradation requirements when tested in accordance with the standard methods of test for sieve or screen analysis of fine and coarse aggregates ASTM C136. The dried fine aggregate shall be combined with hot asphalt cement, and the mix shall be heated to approximately 300 degrees F, at an asphalt plant. The approximate proportion of materials shall be 6% cement asphalt and 94% fine aggregate. Each ton shall be apportioned by weight in the approximate ratio of 120 lbs. asphalt to 1880 lbs. sand. The Contractor shall determine the exact proportions to produce the best possible mixture for construction of the bituminous setting bed to meet construction requirements.

B. Tack Coat: Tack coat shall be #237 2% Neo-Asphalt, Brush Grade as manufactured by Hanover Architectural Products, Hanover, PA, or approved equal. Tack coat shall be an asbestos free, cold applied, rubberized asphalt cement, and shall consist of 2% neoprene rubberized asphalt with 150-degree F softening point and 6.5% inorganic material.

C. Asphalt Block: Unless otherwise noted on the plans, all pavers shall be hexagonally shaped asphaltic concrete blocks, 8” between parallel sides and two inches in thickness with a permissible plus or minus tolerance of 1/16” in any direction. The blocks shall be composed of approximately 6.5% (plus or minus) 0.5% high melting point oxidized asphalt conforming to ASTM Designation D-312 for Type 3 asphalt and 94% graded crushed rock aggregate and mineral filler; at the temperature of 300 degrees F the mix is compressed 4000 lbs. per square inch by high hydraulic presses. The blocks shall be as manufactured by Hanover Architectural Products, Inc., of Hanover, PA, or approved equal.

D. Forms: the forms for this work shall be wood of an approved type and a minimum length of ten feet for tangents and curves, unless otherwise shown on the plans. All forms shall be straight, free from bends and warps at all times, and shall be cleaned thoroughly and oiled before pavement is placed against them. This cleaning and oiling shall be repeated daily as the forms are moved ahead. The forms shall rest firmly upon the thoroughly compacted subgrade throughout their entire length, shall be joined neatly and tightly and staked securely to line and grade at least two hundred feet in advance of the point of placement by using at least three bracing pins of stakes to each ten-foot length of side form, so that they will resist the pressure of the pavement and the impact of the roller without springing.

E. Stone Screenings: Stone screenings shall be either limestone or traprock and shall consist of hard, durable, sharp-edged fragments, free from dirt or other deleterious matter, graded within the following limits:

Passing Sieve (dry analysis)	Percent by Weight
1/2" (12.5 mm)	100
No. 20 (850 um)	20-45
No. 200 (75 um)	5-15

F. Foundation with Stone Screenings: The Contractor shall furnish and install stone screenings. Sand shall be used as a base material for tree pit areas only, as shown on the Contract documents.

PART 3. EXECUTION

3.01 Subgrade Preparation: The subgrade shall be compacted with equipment that will yield the following density:

Cohesive Subgrade - Minimum of 95% of AASHTO T 180 Method density. Cohesion less Subgrade - Minimum of 100% of AASHTO T 180 Method D density.

The Contractor shall remove from the subgrade all debris, foreign and other undesirable material which interferes with satisfactory construction. The fine grade shall not be muddy or otherwise unsatisfactory when the base course material is placed upon it. If the fine grade becomes rutted or displaced, due to any cause whatsoever, the Contractor shall regrade same without additional payment. The Contractor shall trim subgrade to smooth uniform lines to the satisfaction of the Engineer.

3.02 Bituminous Setting Bed: To install the setting bed over the surface of the existing base, place three- quarter inch (3/4") deep control bars directly over the base course. If grades must be adjusted, set wood chocks under depth control bars to proper grade. Set two bars parallel to each other approximately eleven feet (11') long (2" x 6" board). The depth of control bars must be set carefully to bring paver, to the proper grade.

Place some bituminous material between the parallel depth control bars. Pull this bed with the striking board over these bars several times. After each passage, low porous spots must be showered with fresh bituminous materials to produce a smooth, firm and even setting bed. As soon as this initial panel is completed, advance the first bar to the next position in readiness for striking the next panel. Carefully fill up any depressions that remain after removing the depth control bars and wood chocks.

The bed shall be spread in a continuous workmanlike manner. Installation of base in spotted, different, and isolated areas will not be accepted. Bed depth greater than one and one-eighth inch (1-1/8") will not be acceptable.

After setting bed has cooled, it shall be rolled by hand with a one hundred pound (100 lb.) roller to eliminate sponginess and to prepare the surface for the installation of the tack coat. The setting bed shall be protected against all pedestrian traffic and construction equipment

to ensure a level surface for setting pavers.

3.03 Spreading Stone Screenings: The spreading of stone screenings base material shall be accomplished using suitable equipment from piles dumped along the proposed site. Base material shall be evenly spread over the compacted subgrade so that the course will have, after rolling, the required thickness. No segregation of large or fine materials will be allowed, but the screenings, as spread, shall be well graded with no pockets of fine material.

3.04 Rolling Stone Screenings: After the stone screenings base material has been properly spread, it shall be thoroughly compacted by rolling with an approved roller weighing no less than ten (10) tons. The stone screenings shall be sprinkled and saturated immediately before material becomes set. If pavement becomes unstable and waves under the roller, the roller shall be taken off and this portion shall be left to dry out before rolling is resumed.

More screenings shall be added where necessary, and the sprinkling and rolling shall continue until the base has been properly compacted. If necessary to secure satisfactory results, in the opinion of the Engineer, the base shall be sprinkled and backrolled on succeeding days. The Contractor shall maintain and repair the stone screening foundation course until the block has been placed.

3.05 Tack Coat: The neoprene-modified asphalt adhesive tack coat shall be applied by mopping, squeegeeing or troweling over the top of the bituminous setting bed so as to provide a bond between the bituminous setting bed and the paver.

3.06 Setting Pavers: When modified asphalt adhesive is dry to touch, carefully place the pavers by hand, ground finish side up unless otherwise specified, in straight course, with hand tight joints and uniform top surfaces, keeping full alignment according to the patterns shown on the plans.

Pavers may vary slightly in shade and tonality. Installer shall work from at least four (4) pallets at a time in order to create a uniform blend of paver shades.

Joints between blocks shall have a maximum width of one-eighth (1/8") inch. All blocks shall be cleaned when placed on the pavement. In no case shall the bituminous setting bed in front of the pavement be disturbed or walked on during the laying of the blocks.

3.07 Joint Filler: Upon the completion of the work of laying the blocks in each section to the satisfaction of the Engineer, the surface of the blocks shall be swept clean, and the joints filled with fine sand.

All joints shall be filled the same day as the blocks are laid. Filler shall not be applied if the blocks are wet or if the air conditions are such that the filler does not readily enter the joints. Filler shall be well worked into the joints by means of squeegees or other approved devices operating slowly backward and forward. Squeegeeing shall continue until the joints are flush with top surface. Immediately after the joints are filled, the pavement shall be lightly sprayed and cleaned.

3.08 Defects: where defects in composition, compression, or finish appear in the complete work, such finished areas shall be removed to the full depth of the course and the defective material replaced with the required thickness of pavement at the expense of the contractor for such removing and replacing.

3.09 Unless notified by the Engineer in writing, no material shall be mixed or placed when the temperature is at, or lower than 50F.

3.10 Precipitation probability: Placement of bituminous paving materials shall not be scheduled when the Precipitation Probability, obtained by the Contractor from the U.S. Weather Bureau within three (3) hours prior to the start of such operations, equals or exceeds fifty (50) percent. The Contractor shall notify the Engineer of the exact time at which the above information was obtained.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 14 40
GRANITE BLOCK PAVING

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall construct GRANITE BLOCK PAVEMENT ON SAND in accordance with the plans, specifications, and directions of the Engineer. The joints shall be filled with sand or sand cement grout, as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.03 PAYMENT

A. The price bid shall be a unit price per SQUARE FOOT of GRANITE BLOCK PAVEMENT ON SAND installed, and shall include furnishing all labor, materials, and equipment necessary to prepare the subgrade, furnish and place sand cushion, furnish and place blocks, furnish, place, and compact joint filler and all incidentals necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall furnish two (2) samples of blocks before starting work for approval. Blocks used on the work shall conform to the approved samples in all aspects, in the opinion of the Engineer.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 Blocks shall be new or used and shall be cut from fine to medium grained sound and durable granite. The granite shall be reasonably uniform in quality and texture throughout and shall be free from an excess of mica and feldspar and from seams, scales, or evidence of disintegration. If used blocks are reused they shall be clean, free of mortar, asphalt, etc.

Unless otherwise shown on plans, new Granite Block shall be White Mount Airy Granite as manufactured by the North Carolina Granite Corp., Mt. Airy, NC; or Rockville White as manufactured by Cold Spring, MN; or Old Berkshire as manufactured by Williams Stone Company, East Otis, MA; or approved equal.

Blocks shall be fairly rectangular in shape and shall be between seven (7") inches and twelve (12") inches in length, four (4") inches to five (5") inches in width; and three (3") inches to five (5") inches in depth. The blocks shall be cut so that opposite faces will be approximately parallel and adjoining faces approximately at right angles to each other. Blocks shall be so dressed that they may be laid with one inch (1") joints. All blocks shall have one reasonably smooth split head.

2.02 Geotextile shall conform to Section 33 44 31 – Stormwater Membrane Filtration.

Dry Sand Cushion: Sand shall consist of clean, hard, durable, uncoated stone particles, free of lumps of clay and all deleterious substances and shall be so graded that when dry, on hundred (100%) percent shall pass a one quarter (1/4") inch square opening sieve; not more than thirty-five (35%) percent by weight shall pass a No. 50 sieve. Cushion Sand may be rejected if it contains more than ten (10%) percent by weight of loam and silt.

Mortar Joints: Prior to installation confirm with Engineer if mortar joints are required. If required the mortar shall be composed on one (1) part of Portland cement and a maximum of two (2) parts sand, with not more than five (5%) percent of the cement content of hydrated lime or lime putty as specified herein.

PART 3 EXECUTION

3.01 INSTALLATION OF NEW GRANITE BLOCK

A. Preparation of Subgrade: The Contractor shall trim and roll the subgrade to smooth, uniform lines to the satisfaction of the Engineer, prior to placing the pavement. The Contractor shall place geotextile over the prepared subgrade, overlapping edges a minimum of six inches (6") to ensure complete coverage prior to placing the sand base.

B. Sand Cushion Base : The blocks shall be laid on a sand cushion of a maximum thickness of one inch (1"). The sand cushion shall be compacted by being rolled with a roller weighing one hundred fifty pounds (150 lbs.) per foot of width or by tamping, as directed by the Engineer.

Setting Blocks: The blocks shall be carefully laid on a sand cushion according to the patterns shown on the plans or as directed by the Engineer. Joints between blocks shall be a maximum of one inch (1") and a minimum of three-quarters inch (3/4") in width, unless otherwise shown on the plans. All blocks shall be clean when placed in the pavement. Blocks which, in the opinion of the Engineer, are not satisfactorily clean shall be well washed before being placed. Cutting of blocks to meet pattern requirements will be permitted, subject to the approval of the Engineer.

After a sufficient area of block pavement has been laid, the surface shall be tested with a ten (10') foot straight edge laid parallel with the center line and any depression exceeding one-quarter inch (1/4") shall be corrected and brought to the proper grade. All stones disturbed in making replacements or correcting depressions shall be reset and/ or settled into place. Each section of pavement must be acceptable to the Engineer before the joints in that section are filled.

C. Filling Joints: Joints shall be a minimum of one inch (1") in width unless otherwise shown on plans. Where sand joints are called for, the joints shall be filled with cushion sand. The sand shall be firmly packed in the joints between the blocks. Immediately after the joints are filled, the pavement shall be swept clean.

Where mortar joints are called for, the joints shall be completely filled with a cement grout mixture of one part Portland Cement and two parts sand. The grout shall be firmly packed in the joints between blocks. Immediately after the joints are filled, the pavement shall be swept clean. The finished surface shall be free of all cement stain and excess grout and shall be acceptable to the Engineer.

3.02 REMOVAL AND RESET OF EXISTING GRANITE BLOCK PAVEMENT

A. Damaged Blocks: All granite blocks shall be removed and handled with extreme care to avoid breakage. Any blocks which are broken or damaged by the Contractor's operations shall be replaced or repaired at Contractor's expense. The Contractor shall dispose of and remove from the site badly damaged blocks only when ordered by the Engineer.

B. Responsibility: Where the blocks are not to be reset in the same location, they are to be stored until resetting. The Contractor shall be completely responsible for the disposition of existing block and shall replace all block that are lost, stolen or damaged during storage, at its own expense.

C. Preparation of Subgrade: The Contractor shall trim and roll the subgrade to smooth, uniform lines to the satisfaction of the Engineer, prior to placing the pavement.

D. Sand Base: The blocks shall be laid on a sand base of a maximum thickness of one (1) inch. Base sand shall consist of clean, hard, durable uncoated stone particles, free from lumps of clay and all deleterious substances and shall be so graded that when dry, one hundred percent shall pass a 1/4 inch square opening sieve; no more than thirty-five (35) percent by weight shall pass a No. 50 sieve. Cushion sand may be rejected if it contains more than ten percent by weight of loam and silt. The sand base shall be compacted by being rolled with a roller weighing 150 pounds per foot of width, or by tamping as directed by the Engineer.

E. Block Placement: After a sufficient area of block pavement has been laid, the surface shall be tested with a ten foot straight edge laid parallel with the center line and any depression exceeding one- quarter (1/4) inch shall be corrected and brought to the proper grade. All blocks disturbed in making replacements or correcting depressions shall be settled into place by carefully ramming or tamping to grade by the use of a hand tamper applied upon a two-inch board.

Each section of pavement must be acceptable to the Engineer before the joints in that section are filled.

F. Joint Finish: The joints for the outer rows of the paving area shall be completely filled with a cement grout mixture of one part Portland Cement and two parts sand. The grout shall be firmly packed in the joints between blocks. Sand joints shall be used in the inner rows of the paving area, and shall be filled with cushion sand. Immediately after the joints are filled, the pavement shall be swept clean. The finished surface shall be free of all cement stain and excess grout, and shall be acceptable to the Engineer.

The joints in tree pit areas shall be filled with sand cement in the outer rows of the tree pit area, and the remaining inner rows shall be filled with base sand in accordance with NYC Parks standard details for trees. The sand shall be firmly packed in the joints between blocks. Immediately after the joints are filled, the pavement shall be swept clean.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 14 43
POROUS UNIT PAVING

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall furnish all labor, equipment and materials and perform all operations in connection with the construction and installation of cast-in-place porous concrete and precast porous concrete paving slabs as specified herein and as detailed on the Contract Drawings.

B. All new areas of cast-in-place porous concrete and precast porous concrete paving slabs must be to the limits, grades, thicknesses and types, as shown on the Contract Drawings.

C. Before units are installed, ensure all materials and preparation for subbase and edge restraints are acceptable to contractor and manufacturer of precast porous concrete paving slabs. Preparation of subbase materials will include proper compaction procedures, placement of geotextiles, conditions of subgrade soils, and any other potential obstructions to a satisfactory installation as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

B. Section 01 65 00 – Product Delivery Requirements

C. Section 01 66 00 – Protection of Materials and Equipment

D. Section 03 32 00 – Joints in Concrete

E. Section 31 23 16 – Excavation

F. Section 32 90 05 – Soil Mixes

G. Section 31 05 16 – Aggregates for Earthwork

H. Section 31 05 19 – Geosynthetics for Earthwork

I. Section 33 05 05.33 – Double Ring Infiltrometer Testing

J. Section 33 42 11 – Stormwater Gravity Piping

K. Section 33 39 10 – Sanitary and Storm Sewer Structures

L. Section 33 44 31 – Stormwater Membrane Filtration

CONTRACT GI-CONS-7
SECTION 32 14 43
POROUS UNIT PAVING

1.03 PAYMENT

B. The price bid for CAST-IN-PLACE POROUS CONCRETE Porous Unit Paving shall be unit price per SQUARE FOOT and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including subbase, preparation, bond breaker and sealant, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

C. The price bid for PRECAST POROUS CONCRETE shall be unit price per SQUARE FOOT and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including leveling course, appurtenances, joints, sawcutting, preparation, bond breaker and sealant, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Without limiting the generality of the Specifications, all Work herein must conform to or exceed the applicable requirements of the latest editions of the following documents. All referenced specifications, codes, and standards refer to the most current issue available.

1. ASTM C 33 Standard Specification for Concrete Aggregates

2. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

3. ASTM C 136 Testing Method for Sieve Analysis of Fine and Coarse Aggregates

4. ACI 522R-10 Pervious Concrete

5. ASTM C 1701/1701M Standard Test Method for Infiltration Rate of In Place Pervious Concrete

6. ASTMD 1883 Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils

7. ASTM C 136 – Method for Sieve Analysis for Fine and Coarse Aggregate

8. ASTM D 448 – Standard Sizes of Processed Aggregates

9. ASTM D 698 and D 1557 – Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures

10. ASTM D 2940 – Graded Aggregate Material for Bases or Sub bases for Highways or Airports

11. ASTM C 173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

12. ASTM C 97 – Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone

13. ASTM C42 – Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

14. ASTM C78 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

15. ASTM C1116 Standard Specification for Fiber-Reinforced Concrete

16. ASTM C1688 Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete

17. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

18. New York State Department of Transportation (NYSDOT) Standard Specifications.

19. New York City Department of Transportation (NYCDOT) Bureau of Highway Operations Standard Specifications.

20. New York City Department of Transportation (NYCDOT) Infrastructure Design Standards Standard Highway Specifications.

21. American Association of State Highway Transportation Officials Standard Specifications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures.

B. Precast Porous Concrete

1. Source of precast porous concrete and certifications of compliance with specifications for all materials.

2. Shop Drawings: precast porous concrete paving slab complete showing permanent lifting points embedded in the surface of the slab; reinforcing; finishes; all dimensions; the concrete beams intended for testing with all reinforcing and lifting hook placements indicated: edge restraint detail(s) indicate outside perimeter and profiles/sections.

3. Manufacturer's literature indicating product data such as overall dimensions of typical slabs, and one 12-in x 12-in sample that indicates color, texture, edge condition, spacer, weight, shape, details of construction and accessories required.

4. Test results performed by an independent testing laboratory of the following:

   a. Infiltration rate in accordance with ASTM C 1701/C 1701M and bulk density for the precast porous concrete paving slabs conforming to ACI 522R-10. One percent (1%) of the total number of panels intended for the entire project will be tested for compliance with specifications.

   b. Test method procedures to conduct percolation rate testing after installation in accordance with ASTM C1701 Test Method for Infiltration Rate of In-Place Pervious Concrete. The submittal must include information related to the testing apparatus being used (infiltration rings) for approval but the Engineer.

   c. Compressive strength in accordance with ASTM C42/C42M of cores obtained from the precast concrete paving slabs conforming to ACI 522R-10.

   d. Particle-size analysis in accordance with ASTM C 136 for the stone storage reservoir (subbase) and crushed stone choker course (if applicable) with source of supply noted.

   e. Density and void content results in accordance with ASTM C1688 Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete.

   f. Flexural strength test results in accordance with ASTM C78 Flexural Strength of Concrete. Three (3) saw-cut concrete beams prepared specifically for testing purposes as per ASTM C78, with the same concrete mix and reinforcing characteristics as would be representative of a full-size panel. Changes in reinforcement configuration for testing purposes will not be permitted. No end caps on the beams intended for testing will be permitted. One percent (1%) of the total number of panels intended for the entire project will be tested for compliance with specifications.

5. All weather silicone sealant for sealing holes at the slab lifting points.

6. For Tinted Precast Porous Concrete, sample representative of color and quality shall be provided.

1.07 CONTRACTOR QUALIFICATIONS

A. Precast Porous Concrete Installation Contractor Qualifications

1. Installation must be performed by a contractor with at least five (5) years of experience in placing precast porous concrete paving slab units on projects of similar size and scope.

2. Installation must include planning the Work, horizontal and vertical layout, fine grading of subgrades, installing geotextile in accordance with the manufacture's recommendations, placing and compacting crushed stone reservoir storage (subbase), place and screed crushed stone choker (base), installation of edge restraint, and placing precast porous concrete paving slabs.

3. Installation contractor shall have documented experience with the successful installation of at least five (5) separate precast porous concrete paving slab installations similar in complexity of this project.

4. The installation contractor shall use adequate forces including equipment and skilled workers. Workers shall be trained and experienced in the necessary crafts and completely familiar with the specified methods needed for proper performance of this Specification.

5. All materials, methods of installation and workmanship will conform to requirements of ASTM, New York State Department of Transportation, New York City Department of Environmental Protection, or other applicable Standards.

6. Federal, State and/or Municipal approvals, if required for this project.

7. Precast porous concrete paving slab units shall be visually inspected by the manufacturer for completeness, texture and consistency with installation drawings.

8. A small amount of "skinning", not to exceed one (1%) percent of the top or bottom of slab surface areas, will be allowed.

9. Review Contractor's installation plan in a pre-construction meeting with manufacturer's representatives, paving slab installation Contractor, General Contractor, and Owner's representative.

B. Precast Concrete Manufacturer Qualifications

1. Precast concrete manufacturer shall be a member in good standing with the National Precast Concrete Association.

2. The precast porous concrete panels must be supplied by a manufacturer having at least five (5) years of experience in the production and sale or porous concrete panels.

3. The manufacturer must provide a training program for the Contractor detailing handling and installation of the product.

PART 2 PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

A. Locally available material having a record of satisfactory performance should be used.

2.02 PRECAST POROUS CONCRETE PAVING SLAB

A. Precast porous concrete paving slab thickness will be or as shown on plans.

B. Precast porous concrete slabs will be standard natural grey concrete as per the manufacturer unless otherwise noted in the Contract Drawings.

C. Minimum infiltration rate: 250 in. per hr. per ASTM C1701/1701M

D. Concrete average unit weight of 125 LB/CF (+/- 5% conforming to ACI 522R-10). Each individual precast porous concrete panel must be weighed, and the unit must be labelled with the weight, size, and date of manufacture.

E. Precast porous concrete paving slabs must be cured by the manufacturer's approved methods. Slabs must not be shipped until the porous concrete has achieved 85% of the minimum compressive strength and flexural strength (compressive strength: 2,000 psi at 28 days per ASTM C42; flexural strength: 400 psi when tested in accordance with ASTM C78). The void content must be 15% to 25%, conforming to ASTM C1688.

F. Fiber reinforcement must be utilized as a means of reinforcement to achieve the panel design load requirements. Reinforcing must be a product on the New York State Department of Transportation *Approved Materials, Equipment, Methods and Procedures* List, Material Code 711-01.

G. All precast porous concrete slabs must be by the same manufacturer.

H. All precast porous concrete slabs must be provided with spacers to prevent slab-to-slab contact, as required by the manufacturer.

I. The slab units must include a minimum of two (2) permanent lifting points embedded in the top of the slabs for ease of installation, maintenance, removal and reinstallation.

J. Size, shape, design and colors will be in accordance with the Contract Drawings and specifications and will match approved samples.

K. Tinted precast porous concrete paving slabs:

1. Coloring agent shall be BASF Mastercolor or approved equal.

2. BASF MasterPel 200HD Admixture or approved equal shall be used in conjunction with the coloring agent.

2.03 EDGE RESTRAINT

A. Expansion Joint Material must be from a manufacturer listed in the current New York State Department of Transportation's approved list of Pre-Molded Resilient Joint Fillers.

B. Material Standards for Expansion Joint Material must comply with the requirements of Section 2.15, Type IV, in the New York City Department of Transportation Standard Highway Specification, current edition, and must be either one-quarter inch (¼"), one-half inch (½") thick, or as shown on the Contract Drawings.

C. Edge restraint materials consists of the following:

1. Saw cut edges of existing pavement with expansion joint filler positioned between precast porous concrete paving slabs and existing pavement,

2. Existing curb with expansion joint filler positioned between precast porous concrete paving slabs and existing curb.

3. Backer rods and polyurethane joint filler must be provided on the curb side. Joint filler consisting of closed cell foam backer rod and polyurethane non-sag elastomeric sealant such as Sikaflex-2c NS TG, Akonaflex Expansion joint filler, or approved equal must be used.

4. Expansion joint material must be placed per Contract Drawing details between edge restraints and panels. Cost to be included in the cost of the panels.

2.04 STONE SUBBASE

A. Compacted stone (subbase) below the precast porous concrete and the cast-in-place porous concrete must conform to Section 31 05 16 – Aggregates for Earthwork.

2.05 GEOTEXILE

A. Geotextile around perimeter of storage reservoir (subbase) layers in the precast porous concrete must be as follows:

1. Geotextile shall conform to Section 33 44 31 – Stormwater Membrane Filtration.

2.06 ALL WEATHER SILICONE SEALANT

A. All weather silicone sealant must be a clear, permanently flexible, weather-proof, watertight, and all-purpose exterior protective sealant such as model M60.01 Advantage Silicone Sealant as manufactured by General Electric, or equal.

PART 3 EXECUTION

3.01 MINIMUM INSTALLATION REQUIREMENTS

A. Precast Porous Concrete

1. Precast porous concrete must be installed as shown on Contract Drawings.

2. Excavation must be made to dimensions enough to accommodate placement of the clean, open-graded stone, geotextiles, and leveling course for the precast porous concrete panels.

   Support must be provided for trench walls to prevent collapse as needed.

3. Any excess soil placed or washed on top of the final elevation of soil subgrade to trap sediment transported by runoff from adjacent construction areas must be removed before placement of storage reservoir aggregate and geotextile materials.

4. Keep area where precast porous concrete paving slabs are to be installed free of sediment during the entire construction period. Any materials contaminated with sediment must be removed and replaced with clean materials.

5. Do not damage drainpipes, underdrains, observation wells, roadway boxes, manholes or any other utilities during installation. Report any damage immediately to the Engineer.

6. Installation of Modular Precast Porous Concrete Slabs must be in strict accordance with the manufacturer's recommendations, all information in this specification, and all related drawings.

7. Subgrade Preparation

   a. Verify that all field infiltration and permeability testing of the subgrade has been performed, that test results meet the project design requirements and construction of the subgrade has been approved by the Engineer prior to installation of the precast porous concrete paving slabs.

8. Prepared subgrades will not be compacted and must not be subject to construction equipment traffic.

9. Only light equipment will be used to build the precast porous concrete paving slab system.

10. Where erosion has caused accumulation of sediment or ponding on the subgrade, remove sediment with light equipment and/or manually. Scarify the underlying soils to a minimum depth of six (6) inches with the bucket teeth of a backhoe, or other method as approved by the Engineer.

11. Restore any subgrade areas damaged by erosion, ponding, or traffic compaction to design line and grades prior to installation of storage reservoir layer to the satisfaction of the Engineer.

3.04 PRECAST POROUS CONCRETE PAVING SLAB PLACEMENT

A. Place geotextile fabric on prepared subgrade side slopes and wrap storage reservoir as shown in the Contract Documents. Secure in place to prevent wrinkling from vehicle, equipment and worker foot traffic.

   1. Overlap geotextile fabric edges in accordance with the manufacturer's requirements, and a minimum of twelve (12) inches in the direction of drainage flow.

B. The storage reservoir (subbase) can be 1.5" stone per DEP Standard Specifications for On-Site Green Infrastructure as long as the subbase course is compacted per manufacturer's specifications and the leveling course is 3/8" stone. Both subbase and leveling courses must be comprised of clean, washed, stone per manufacturer recommendations. Lay slabs as shown on the Contract Drawings and as approved by the Engineer.

1. Place stone per ASTM C33 Size number 57 (3/4") over the prepared subgrade and spread and level evenly by raking to minimum thickness as specified by the Engineer, or a minimum of 6 in. Do not disturb prepared subgrade or shift, wrinkle or fold the geotextile fabric.

2. Storage Layer must be hand compacted before placement of precast porous concrete.

3. The surface tolerance of the compacted storage reservoir layer shall be ± 3/8 in. under a 10 ft. straightedge.

4. Compacted storage reservoir area shall not substantially exceed that which is covered by paving slabs by the end of the day.

C. Leveling course shall be minimum 3" thick, compacted, and provide a smooth uniform surface for the placement of the precast porous concrete slab. Leveling course must be free of depressions, protrusions, or gaps that would cause the precast porous concrete slab from being uniformly supported.

D. Slabs must only be lifted and placed using swivels and spreader chains. Chains, cables or slings should never be wrapped around slabs for lifting under any circumstances. Swivels shall be bolted securely but not over-tightened.

E. Precast porous concrete paving slabs must be placed so they are separated with 1/8-in spacers provided by the manufacturer of the precast porous concrete paving slabs. Joint widths and lines must be continually straight as paving proceeds.

F. Place units hand tight without using metal hammers, pry bars or drift pins. Make horizontal adjustments to placement of laid slabs with wood wedges and levers, and rubber mallets as needed.

G. Provide joints between slabs of 1/8 in. wide. No joints are to exceed 3/16 in. in width.

H. Joint lines must not deviate more than ±½ in. over 50 ft. from string lines.

I. Joints must never be filled with loose material, included but not limited to, sand, stone dust, stone chips, etc.

J. Fill gaps at the edges of the paved area with properly-sized end slabs.

K. Cut end slabs to be placed along the edge or corners with a masonry saw. Cut units must be no shorter than 1/4 of a whole slab.

L. Adjust bond pattern at pavement edges such that cutting of edge slabs is minimized. Do not expose cut slabs to vehicular traffic. Cut slabs at edges as indicated on the Contract Drawings.

M. Keep equipment off unrestrained paving slabs.

N. After an area is completely paved, set the precast porous concrete slabs into the screed choker course (base) layer by trafficking with light rubber-tired equipment.

O. Remove and replace any slabs cracked or damaged during installation with new ones. Reset slabs not in conformance with specified installation tolerances.

a. Hairline cracks (1/8" or smaller) with no vertical or horizontal displacement of panels shall be considered as to not interfere with the proper functioning or performance of the system, and are acceptable when immediately repaired upon observation per manufacturer's recommendation.

b. Where approved by the Engineer, cracks 1/8" or larger with no vertical displacement may be repaired under the direction of the manufacturer.

c. Any cracked panels with horizontal displacement greater than ¼" or a vertical displacement of any size shall be replaced.

d. The repairs must be properly finished and cured. The color of the repair area must match as closely as possible with the rest of the panel color. Repairs shall be made with a mixture of self-leveling polyurethane sealant for horizontal applications and cement, as directed by the manufacturer.

P. Install edge restraints per the Contract Drawings and manufacturer's recommendations at the indicated locations and elevations.

Q. Check final surface elevations of set slabs for conformance to design drawings. The final surface tolerance from grade elevations must not deviate more than ± 3/8 in. under a 10 ft. straightedge.

R. The surface elevation of set slabs must be flush with manholes or the top of utility structures as shown on the Contract Drawings.

S. Protection

1. After slabs are placed in final position, apply clear all weather silicone sealant to the surface of each lifting point hole in a manner so that hole is completely covered, and debris and water will not enter the hole. Do not completely fill the hole with

sealant. Follow sealant manufacturer's recommendations for application and curing instructions.

2. After Work in this section is complete, the general contractor shall be responsible for protecting the precast porous paving slab system from damage and/or contamination with mud, dirt, grass cuttings, accumulation of foliage and debris.

3.06 WEATHER CONSIDERATIONS

A. Do not place and/or compact open graded stone subbase in rain or snow, or on saturated or frozen subgrade.

B. Do not place and/or screed choker course base in rain or snow, or on saturated or frozen subbase.

C. Do not install cast in place or precast porous concrete in rain or snow, or on saturated or frozen base.

3.07 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall provide for the delivery, handling and storage of materials in accordance with the requirements of Section 01 65 00 – Product Delivery Requirements and Section 01 66 00 – Protection of Materials and Equipment and as noted below.

B. Coordinate delivery to not interfere with other construction and avoid delays.

C. Protect precast porous concrete paving slab units and accessory materials during shipment, storage and construction against staining and damage.

D. Precast porous concrete paving slab units must be handled and transported in a position consistent with their shape and design in order to avoid stresses which could cause cracking or damage.

E. Precast porous concrete paving slab units must be lifted or supported only at the points shown on the Working Drawings or as recommended by the manufacturer.

F. Store precast porous concrete paving slab units according to manufacturer's recommendation.

G. Store precast porous concrete paving slab units such that they are kept free from mud, dirt, grass cuttings, accumulation of foliage and debris. Pressure wash with clean water to remove dust within twenty-four (24) hours prior to placement.

H. Panels must not be exposed unsecured to vehicular and pedestrian traffic. Skid steer and forklift equipment must be kept off unsecured paving panels.

I. Geogrid, geofabrics, crushed stone, and liner materials must be kept clean and prepared for installation.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 14 44
GROUTED FLAGSTONE

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall construct GROUTED FLAGSTONE in accordance with the plans, specifications, and directions of the Engineer. The joints shall be filled with sand cement grout, as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 03 60 00 – Grouting

C. Section 33 44 31 – Stormwater Membrane Filtration

1.03 PAYMENT

A. The price bid shall be a unit price per SQUARE YARD of GROUTED FLAGSTONE installed, and shall include furnishing all labor, materials, and equipment necessary to prepare the subgrade, furnish and place geotextile and stone bed layer, furnish and place stone, furnish, place, and compact grout and all incidentals necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall furnish two (2) samples of flagstone before starting work for approval. Flagstone used on the work shall conform to the approved samples in all aspects, in the opinion of the Engineer.

PART 2 PRODUCTS

2.01 Flagstone shall be new or used. The flagstone shall be approximately 3" thick and reasonably uniform in quality and texture throughout, irregular shaped and shall be free from evidence of disintegration. Surface exposed to the elements shall be relatively flat.

2.02 Geotextile shall conform to Section 33 44 31 – Stormwater Membrane Filtration

2.03 Stone Bed Layer: Base Stone shall consist of #57 stone, clean washed, free from lumps of clay and all deleterious substances and shall be graded when dry to meet the following:

Screen Size	%Passing
1"	95-100
½"	25-60
No. 4	0-10

PART 3 EXECUTION

3.01 INSTALLATION OF GROUTED FLAGSTONE

A. Preparation of Subgrade: The Contractor shall trim and roll the subgrade to smooth, uniform lines to the satisfaction of the Engineer, prior to placing the pavement. The Contractor shall place geotextile over the prepared subgrade, overlapping edges a minimum of six inches (6") to ensure complete coverage prior to placing the stone bed layer.

B. Stone Bed Layer: The flagstone shall be laid on a stone bed layer of a thickness of three inch (3"). The stone bed layer shall be compacted by being rolled with a roller weighing one hundred fifty pounds (150 lbs.) per foot of width or by tamping, as directed by the Engineer.

C. Setting Stone: The flagstone shall be carefully laid on the bed layer as shown on the plans or as directed by the Engineer. Joints between each stone shall be a maximum of one inch (1") and a minimum of three-quarters inch (3/4") in width. All stone shall be clean when placed in the pavement. Flagstone which, in the opinion of the Engineer, are not satisfactorily clean shall be well washed before being placed. Cutting of blocks to meet pattern requirements will be permitted, subject to the approval of the Engineer.

After a sufficient area of flagstone pavement has been laid, the surface shall be tested with a ten foot straight edge laid parallel with the center line and any depression exceeding one-quarter inch (1/4") shall be corrected and brought to the proper grade. All stones disturbed in making replacements or correcting depressions shall be settled into place by carefully ramming or tamping to grade by the use of a hand tamper applied upon a two inch (2") board. Each section of pavement must be acceptable to the Engineer before the joints in that section are filled.

D. Filling Joints: Joints shall be a minimum of three-fourths inch (3/4") in width unless otherwise shown on plans. The joints shall be completely filled with a cement grout mixture in accordance with Section 03 60 00 – Grouting. The grout shall be firmly packed in the joints between blocks. Immediately after the joints are filled, the pavement shall be swept clean. The finished surface shall be free of all cement stain and excess grout and shall be acceptable to the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 16 13
CURBS AND GUTTERS

PART 1 GENERAL

1.01 REQUIREMENTS

A. This Section describes the requirements for STEEL FACED CONCRETE CURB and CONCRETE CURB. The Contractor shall furnish and install STEEL FACED CONCRETE CURB and CONCRETE CURB in accordance with the plans and Specifications and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 23 16 – Excavation

C. Section 03 30 00 – Cast-in-Place Concrete

D. Section 32 12 16 – Asphalt Paving

1.03 PAYMENT

A. The price bid shall be a unit price per LINEAR FOOT of STEEL FACED CONCRETE CURB of curb furnished and incorporated in the Work, and shall include furnishing all labor, material, and equipment, including steel facing, expansion joints painting and all incidentals necessary to complete the Work in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid shall be a unit price per CUBIC YARD of CONCRETE CURB of curb furnished and incorporated in the Work, and shall include furnishing all labor, material, and equipment, including expansion joints, preparation, bond breaker and sealant, as applicable, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Section 03 30 00 – Cast-In-Place Concrete.

1.05 REGULATORY COMPLIANCE

A. New York City Department of Transportation (NYCDOT) Standard Highway Specifications.

1.06 SUBMITTALS

A. All submittals shall be in accordance with the requirements of the Section 01 33 00 – Submittal Procedures.

B. Design Mix Report per Section 03 30 00 – Cast-In-Place Concrete.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 CONCRETE

A. Refer to Section 03 30 00 – Cast-In-Place Concrete.

2.02 CEMENT

A. Refer to Section 03 30 00 – Cast-In-Place Concrete.

2.03 STEEL FACING

A. Steel facing shall be in accordance with the standard details for steel faced curb – Steel Facing Type D – Bent Plant of the New York City Dept. of Transportation. The steel facing shall be bent to the radius shown on the plan provided with straight tangents at the ends, three (3) feet in length, and shall be provided with anchors of the shape and size and attached at such points as shown.

2.04 STEEL RODS

A. Steel rods for anchoring the steel facing in the concrete shall conform with current New York City Department of Transportation (NYCDOT) specifications.

2.05 FINISH

A. Steel facing shall receive three (3) coats of paint. Steel surfaces shall be clean and rust free.

First Coat (Shop Applied): Kem Kromik Universal Metal Primer B50NZ6 Series, color shall be Brown/Red Oxide, as manufactured by Sherwin Williams Company, Woodside, NY or approved equal. Primer is an alkyd resin, flat finish coating having a dry film thickness of 3 to 4 Mills. Paint requires 16 hours @ 77° F before recoating. Performance shall meet or exceed the standards of Federal Spec. TT-P-86H, Type III & IV.

Second and Third Coats: Sherwin Williams A-100® Exterior Latex Flat, A6 Series, Steely Gray (SW2120), as manufactured by Sherwin Williams Company, Woodside, NY or an approved equal. Second and third coat are a latex, flat finish coating having a dry film thickness of 2/3 thickness of 1.3 Mills. Application shall be when material temperature is above 35° F and at least 5° F above the dew point, per manufacturer's recommendations. Do not apply when air or surface temperatures may drop below 35° F within 48 hours.

2.06 EXPANSION JOINT

A. The expansion joint material shall be one of the following: A premoulded bituminous fiber joint filler, as specified in Section "B" (requires a bond breaker and sealant) or, A premoulded closed call expanded polyethylene foam joint filler, such as MasterSeal 920 by BASF Inc., (requires only sealant), Shakopee, MN, or, an approved equal of any of the above.

2.07 BOND BREAKER

A. If bituminous fiber material is used, a bond breaker such as one-half inch (½") wide polyethylene tape or five-eighths inch (5/8") diameter expanded polyethylene foam backer rod shall be installed as recommended by the manufacturer. A bond breaker will not be required for a premoulded foam joint, but sealant is always required.

2.08 SEALANT

A. Prepared expansion joints shall be coated with a primer followed by installation of a bond breaker and a self-leveling two-component polyurethane-based elastomeric sealant. Contractor shall apply Sikaflex 429 primer with Sikaflex - 2C, SL sealant, or MasterSeal P 173 with MasterSeal SL 2 sealant or approved equal. Color of sealant shall be concrete gray. Asphalt cement will not be approved as a sealant.

Sikaflex products are manufactured by Sika Corp., Lyndhurst, NJ. MasterSeal products are manufactured by BASF Inc., Shakopee, MN.

PART 3 EXECUTION

3.01 INSTALLATION

A. The steel faced curb shall be set on a concrete foundation and backed with concrete for a width of eight (8) inches from the face of the curb, as shown on the standard detail "Street Curbs and Ramps" of the Department of Parks. The steel facing shall be placed within forms, upon suitable chairs to the proper line and grade. The concrete shall be poured carefully into the forms and worked around anchors in a workmanlike manner. It shall be placed in sections equal in length to length of steel angle, and the ends provided with expansion joints as required.

Care shall be taken when installing curbs and that no roots shall be cut without written permission of the Director of Landscape Construction or his designated representative. The Contractor shall notify the Landscape Construction Unit by email at Capital.Arb-Hort@parks.nyc.gov.

Forms: 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.

Pouring Concrete: 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 troweling and wood floating.

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.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 17 23
COLOR SEAL – PAINTED MAP COLOR SEAL COATS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Section, the Contractor shall apply a painted map color seal coat system to the asphaltic pavements on NYC Parks - owned Properties and/or restoration of roadway and parking markings in accordance with the plans, specifications, and directions of the Engineer.

B. PAINTED MAP COLOR SEAL COAT shall conform to the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 32 12 16 – Asphalt Paving

B. Section 32 12 23 – Pavement Markings

C. Section 32 12 73 – Asphalt Paving Joint Sealants

1.03 PAYMENT

A. Unit prices include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the work, including preparation of surfaces, patching mix, resurfacer coats, intermediate coats, wearing coats and painted lines, in accordance with the plans and specifications to the satisfaction of the Engineer.

B. The prices bid shall be a unit price per EACH PAINTED MAP OF THE UNITED STATES COLOR SEAL COAT applied and accepted.

C. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be executed as described under Section 32 12 73 Asphalt Paving Joint Sealants.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Federal Specifications, U.S. General Services Administration

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. At the time of the Pre-construction meeting, and in accordance with the specifications, the Contractor shall be required to submit, for approval, complete details of the painted map color seal coat system it proposes to use. The specifications of all information (products or systems, manufacturer's names, product description, technical and laboratory data, mixing information, methods of application, rates and all other data) as may be required to

demonstrate to the satisfaction of the Engineer that the painted map color seal coat system the Contractor proposes to use meets the requirements of these specifications.

B. The Contractor shall be required to submit color samples for approval by the Engineer.

C. Paint Substitution: A written request for paint substitution, along with manufacturer's data sheets shall be submitted for approval a minimum of two (2) weeks prior to the intended date of paint application. All paint substitutions must be approved in writing.

D. Paint Stencil: Shop drawings shall be prepared at the scale of the construction documents, or larger, and shall contain all pertinent information regarding layout and material selection of painting stencils. These drawings shall be submitted to the Engineer for approval.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 PAINTED MAP COLOR SEAL COAT FOR ASPHALT SURFACES

A. The painted map color seal coat system consists of multiple resurfacer coats, three (3) intermediate coats and one (1) wearing coat. Patching mix shall be installed as necessary and as described under Part 3.

B. Patching Mix (also known as leveling mixture) The patching mix shall be "California Court Patch Binder", as manufactured by California Sport Surfaces, Andover, MA, "Laykold Acrylic Deep Patch" as manufactured by Advanced Polymer Technology, Harmony, PA, "Acrylic Patch Binder C1480" as manufactured by SportMaster Sport Surfaces, Sandusky, OH, "Action Pave Acrylic Resurfacer" as manufactured by Copeland Coating Co., Nassau, NY, or approved equal. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be Armor Crack Repair System, or approved equal.

C. Resurfacer coats (also known as Filler Coat) shall consist of a mixture of acrylic resurfacer and No. 40-60 mesh Silica sand. The resurfacer shall be "California Acrylic Resurfacer", as manufactured by California Sport Surfaces, Andover, MA; "Laykold Acrylic Resurfacer" as manufactured by Advanced Polymer Technology, Harmony, PA; "Acrylic Resurfacer C1300" as manufactured by SportMaster Sport Surfaces, Sandusky, OH, "Action Pave Acrylic Resurfacer" as manufactured by Copeland Coating Co., Nassau, NY, or approved equal.

The sand shall be mixed with the resurfacer at the rate of 600 to 800 pounds of sand to 55 gallons of undiluted resurfacer, or at such other rate as the manufacturer shall require to meet job conditions. Water shall be added per manufacturer's specifications.

D. The intermediate coats shall be full color acrylic filler coatings consisting of colored acrylic latex emulsion compounded with Silica sand. The intermediate coats shall be "Plexichrome" or "DecoColor MP", as manufactured by California Sports Surfaces, Andover, MA; "Laykold ColorCoat Concentrate" as manufactured by Advanced Polymer

Technology, Harmony, PA; "Color Concentrate" as manufactured by SportMaster Sport Surfaces, Sandusky, OH, "Action Pave Acrylic Filler" as manufactured by Copeland Coating Co., Nassau, NY, or approved equal.

Sand shall be No. 80-100 mesh Silica sand. Sand and water shall be added per manufacturer's specifications.

E. The wearing coats shall be full color acrylic latex emulsion. The wearing coats shall be either "Plexichrome" or "DecoColor MP" as manufactured by California Sports Surfaces; "Laykold Colorcoat Concentrate" as manufactured by Advanced Polymer Technology, Harmony, PA; "Color Concentrate" as manufactured by SportMaster Sport Surfaces, Sandusky, OH, "Action Pave Acrylic Finish" as manufactured by Copeland Coating Co., Nassau, NY, or approved equal. Colors shall be as shown on plans. Water shall be added per manufacturer's specifications.

F. Line paint to be installed on the painted map color seal coat shall be a 100% acrylic emulsion. All line paint to be textured unless otherwise shown on the drawings. The line paint shall be thinned with water only. The paint shall be suitable for application by brush, spray or roller. Line color shall be as shown on the plans.

The paint shall be equal to "Hi Hide Line paint", as manufactured by California Sports Surfaces, Andover, MA, Laykold Line Paint as manufactured by Advanced Polymer Technology, Muskegon, MI, SportMaster Line Paint as manufactured by SportMaster Sport Surfaces, Sandusky, OH, or approved equal.

PART 3 EXECUTION

3.01 RESTRICTIONS FOR COLOR COATED ASPHALT SURFACES

A. Before the painted map color seal coat painted map color seal coat system is applied, the asphaltic surface to receive the system shall have cured for a minimum of thirty (30) days. The surface temperature shall be taken using a surface thermometer. The Contractor shall take readings every sixty (60) feet in all directions. If the average surface temperature is below fifty-five degrees Fahrenheit (55° F.) or expected to be below 55 F degrees within 24 hours, application will not be permitted. If the average surface temperature is above eighty degrees Fahrenheit (80° F.), the surface shall be water fogged before application will be permitted. Application shall not be permitted during rain events or if a rain event is expected within 24 hours.

3.02 INSTALLATION FOR COLOR COATED ASPHALT SURFACES

A. Preparation of Surfaces: The surface shall be cleaned of all dirt, loose sand, and stone. The Contractor shall power wash the surface clean to the satisfaction of the Engineer prior to applying the painted map color seal coat system. When installed on existing pavement where crack repair is deemed necessary, crack repair shall be performed per manufacturer's instructions prior to application of resurfacer coats. Before application of each coat, the

surface shall be blown free of all dirt and foreign matter and shall be free from standing water and oils.

B. Application of Materials: All materials shall be mixed at the site unless otherwise permitted by the Engineer. If the Contractor is granted permission to mix any material off the site, he shall arrange with the Engineer to have a representative of the Engineer present during the mixing operations. The mixed materials shall be homogeneous, segregation before or during application will not be permitted. All materials shall be applied by approved hand or mechanical squeegees. Each completed application shall be smooth, even textured, free from ridges, valleys, and tool marks.

C. Resurfacer Coats: The purpose of the resurfacer coats is to fill the surface voids of the asphalt pavement. To this end the resurfacer coat material shall be applied in multiple coats until the surface of the asphalt is free of voids and no telegraphing of the aggregate in the asphalt is visible. A minimum of two coats shall be applied. However, the Contractor shall apply as many additional coats as may be required to fulfill the above requirements. The resurfacer may be diluted with water in accordance with the manufacturer's specifications to obtain workability.

The application of the resurfacing coat shall be parallel in one direction of the courts, a second application may be made at ninety degrees 90° to the first coat.

After the first coat of resurfacer is complete, the entire area shall be flooded with water and allowed to drain. Any areas holding over one-sixteenth inch (1/16") (thickness of a nickel) depth of water shall be leveled with a Patching mix and allowed to thoroughly cure. Patching mix shall be applied in a maximum of (1/4") one-quarter inch lifts. A maximum of (1/2") one-half inch total patch (2 lifts) shall be allowed. This process of water flooding and leveling shall be repeated until all depressions over one-sixteenth (1/16") inch have been eliminated. Surface shall be inspected to ensure all depressions have been filled before application of Intermediate Coats.

D. Intermediate Coats: Three intermediate coats shall be applied. The total amount of material to be applied shall be .10 to .16 gallons per square yard based on the material prior to any dilution. The acrylic resurfacer may be diluted as recommended by the manufacturer to obtain workability.

E. Wearing Coats: One wearing coat shall be applied perpendicular to each other. In the case of tennis court application, the wearing coat shall be applied parallel to the net line. The total amount of material to be applied shall be .18 to .30 gallons per square yard prior to any dilution. The material may be diluted as recommended by the manufacturer to obtain workability. Sand shall not be added to the wearing coats.

F. Line Paint: All painted lines shall be carefully laid out and defined on the surface by chalk markings before being painted.

Two (2) coats of line paint shall be applied. At least two (2) hours shall elapse between the painting of the first and second coats. All painted lines shall be accurately painted within the limits shown on the plans. Lines shall be clear and distinct with sharply defined edges.

3.03 GUARANTEE INSPECTION

A. Upon completion of the work in this section, Contractor shall request a Guarantee Inspection from DEP. At the guarantee inspection if the painted map color seal coat is found to be peeling or fading due to improper installation the Contractor shall be responsible to re-apply at its own expense.

END OF SECTION

CONTRACT GI-CONS-7

SECTION 32 18 13

SYNTHETIC GRASS SURFACING

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide synthetic turf suitable for use for intermediate and varsity football, soccer, softball and baseball. Work shall be as indicated on the Contract Documents and as specified herein and shall include, but not be limited to, the following:

1. Synthetic Turf - Infill Type on Stone Base.

2. Perimeter terminations.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 03 30 00 – Cast-In-Place Concrete

C. Section 31 23 16 – Excavation

D. Section 33 42 11 – Stormwater Gravity Piping

E. Section 33 46 23 – Modular Buried Stormwater Storage Units

F. Section 33 44 31 – Stormwater Membrane Filtration

1.03 PAYMENT

A. The price bid for SYNTHETIC GRASS SURFACING shall be unit price per SQUARE YARD of synthetic turf and shall include the cost of all labor, equipment, and materials necessary or required to complete the Work, including, laser leveling of subgrade and finished grade, shock pad, synthetic turf carpet, 100% adhesive coverage seam tape between turf and shock pad, coated sand infill material, filter fabric wrap for perforated pipes, sock, flush concrete curb, recycled plastic lumber edge, reinforcing rods, sealant, attachments, all necessary testing, two (2) follow-up visits, all delivery charges and submittals, all in accordance with the plans, specifications, and directions of the Engineer.

B. Ten (10%) percent of the total dollar amount for this item shall be withheld until the first Independent Field conducted G-max Test results are submitted and found acceptable to the Engineer.

C. The price bid shall be a unit price per SQUARE FOOT of GEONET, and shall include the cost of all labor, materials, and equipment necessary to furnish geonet in accordance with the plans and specifications, and to the satisfaction of the Engineer.

D. The price bid for the Work associated with the cost of all labor and materials for the stone base aggregates, where shown on plans, shall be paid for in accordance with Section 31 05 16 – Aggregates for Earthwork.

E. The price bid for the Work associated with the cost of all labor and materials for the modular buried stormwater storage units, where shown on plans, shall be paid for in accordance with Section 33 46 23 – Modular Buried Stormwater Storage Units.

F. The price bid for the Work associated with the cost of all labor and materials for the perforated pipe underdrain, where shown on plans, shall be paid for in accordance with Section 33 42 11 – Stormwater Gravity Piping.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. American Society for Testing and Materials (ASTM)

a. ASTM F1551 Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials

b. ASTM D5848 Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings

c. ASTM D5823 Standard Test method for Tuft height of Pile Floor Coverings

d. ASTM D611 Standard Test Methods for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

e. ASTM D789 Standard Test Method for Determination of Relative Viscosity and Moisture Content of Polyamide

f. ASTM D6108 Standard Test Method for Compressive Properties of Plastic Lumber and Shapes

g. ASTM D6109 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products

h. ASTM D1577 Standard Test Methods for Linear Density of Textile Fibers

i. ASTM D1335 Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings

j. ASTM D2859 Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials

k. ASTM D5034 Standard Test method for Breaking Strength of Textile Fabrics

l. ASTM D3218 Standard Test method for Specification of Polyolefin Monofilaments

m. ASTM F355 Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials

n. ASTM F1015 Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces

o. ASTM F1936 Standard Specifications for Impact Attenuation of Turf Playing Systems as Measured in the Field

p. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems using a Radiant Heat Energy Source

2. Governing Sport Authorities

a. Installation shall comply with rules and/or regulations set forth by NFSHSA and PSAL. In addition, NCAA regulations / rules shall apply if previous Authorities are in conflict.

1.05 REGULATORY COMPLIANCE

A. Work in this Section shall be in compliance with the following:

1. New York City Building Code.

2. New York City Public School Athletic League (PSAL).

1.06 SUBMITTALS

A. Certificate of Subbase Acceptance

1. Prior to the beginning of installation, the manufacturer/installer of the synthetic turf and pad shall inspect the subbase and supply a Certificate of Subbase Acceptance for the purpose of obtaining manufacturer’s warranty for the finished synthetic playing surface. Acceptance of subbase (see Installation) shall be on synthetic turf manufacturer’s representative letterhead.

B. Shop Drawings

1. Shop drawings shall be prepared at the scale of the construction documents, or larger, and shall contain all pertinent information regarding installation, including seaming plan, edge detail, permanent field lines, logos, etc. These drawings shall be submitted to the Landscape Architect for approval prior to the manufacturing and shipping of materials.

C. Installer Qualifications

1. The resilient synthetic turf sub/contractor must demonstrate experience on at least five (5) installations of infill type synthetic turf. The synthetic turf manufacturer must certify the designated supervisory personnel on the project as competent. The Contractor shall submit for approval, the name and qualifications of the proposed sub/contractor. The Contractor shall submit the following:

   a. A letter on turf manufacturer's letterhead affirming the sub/contractor as competent in the installation of the material, including seams and proper installation of their product.

   b. Proof of five (5) installations of infill type synthetic turf by the proposed sub/contractor.

   c. Name, address, and phone numbers for a minimum of three (3) professional references associated with synthetic turf Work performed by proposed sub/contractor.

D. Synthetic Turf Sample and Test Results

1. The Contractor shall submit an eighteen inch by twenty- four inch (18" x 24") minimum sample of green turf carpet without infill material showing backing with perforations. Samples of additional turf colors, where shown, shall also be submitted. Sample warrantee shall be submitted for approval prior to approval of turf subcontractor. Certified copies of independent (third Party) laboratory reports shall be submitted certifying the following properties at a minimum:

   a. Pile Weight and Total Product Weight: ASTM D5848

   b. Primary and Secondary Backing Weights: ASTM D5848

   c. Tuft Height: ASTM D5823

   d. Tuft Bind: ASTM D1335

   e. Grab/Tear Strength: ASTM D5034

E. Heavy Metal and Semi-Volatile Organic Content Testing

1. The Contractor shall submit test results from the approved independent laboratory showing that turf fibers and infill meets the requirements specified herein.

F. Independent Laboratory

1. Testing shall be conducted by an independent environmental laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP). The Contractor shall submit certification that the proposed laboratory is NELAP accredited to perform environmental analyses for the metals in question in both (a.) non-potable water and (b.) solid and hazardous waste. If the laboratory is situated in the State of New York, NELAP accreditation must be provided by the New York State Department of Health Environmental Laboratory Approval Program (Wadsworth center). Laboratories outside New York State may obtain this accreditation from any State that issues NELAP accreditation.

G. Infill Samples and Testing:

1. Two (2) samples, one (1) quart in size, of proposed infill material, along with test results for sphericity, roundness and sieve analysis shall be submitted for approval prior to installation.

H. Adhesive

1. Product literature shall be submitted prior to installation.

I. Seam Tape Sample

1. Contractor shall submit a twelve (12”) inch sample of the seaming tape the manufacturer is proposing to use.

J. Shock Pad Sample

1. The Contractor shall submit an eighteen inch by twenty-four inch (18” x 24”) minimum sample of the shock pad for approval.

K. Warranty

1. The Contractor shall submit a manufacturer’s warranty listing, at minimum, an eight (8) year guarantee against UV fading, degradation, or defects, such as excessive wear or fibrillation, stipulated as more than a forty percent (40%) decrease in pile height, seam rupture, dislodgment, or inadequate drainage. The warranty shall also guarantee a G-Max rating below 145 at the time of installation and below 180 for the remaining term of the warranty. Warranty shall clearly state that if test results show that G-Max rating has not been met, the manufacturer will

repair or replace product within the warranty period as necessary to meet those requirements at no cost to the City.

L. Maintenance Manuals

1. Prior to Final Acceptance, the Contractor shall submit three (3) copies of Maintenance Manuals, which shall include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including any painting or markings.

M. Independent Field Test for G-Max

1. After completion of synthetic turf, the Contractor shall engage the services of an independent laboratory capable of performing field tests utilizing ASTM F355 Test Method A, in accordance with ASTM F1936. Tests shall be conducted on two (2) separate visits. The first test shall be conducted after installation, but prior to the Final Acceptance of the Work. The second test shall be conducted at one of the two follow-up visits required within the guarantee period. Both tests shall be performed with no visible frost on the ground.

1.07 QUALITY CONTROL

A. Manufacturer's Qualifications: The turf manufacturer must have ten installations of 60,000 square feet or more of the specific type turf system and fiber that that has been used for (American) varsity football and soccer and has been in use for a minimum of three years. These installations must be located in the continental United States.

B. The field installation shall be made under the direct, active, personal supervision of technical representatives of the turf manufacturer. All other key positions shall be manned by experienced employees of the installer.

C. The Contractor shall keep a full-time superintendent on the Project during the installation of the synthetic turf.

D. The synthetic turf system supplied shall be as previously installed and used at all levels of competition, including university.

E. Installed system shall comply with the following:

1. Relative abrasiveness: Abrasive Index of 20.2, as measured in accordance with ASTM F 1015.

2. Shock Absorbency: G-Max reading of no greater than 105 G's at 70 degrees F as measured in accordance with ASTM F355, Method A at any location within 30 days of installation. The system will not exceed 135 G's over the warranty period.

3. Flammability: Passes flame spread and smoke development as tested in accordance with ASTM D2859.

4. Permeability: Surfaces shall drain up 10 inches of rain per hour over a 24-hour period.

1.08 PRODUCT HANDLING

A. Turf system material shall be protected before, during and after installation.

B. Installed Work and materials of other trades also shall also be protected.

C. Do not expose geotextile fabric to sunlight for more than one week during its storage and installation.

1.09 TESTS

A. Testing shall be conducted by an accredited independent environmental laboratory in conformance with the National Environmental Laboratory Accreditation Program (NELAP) conference standards. (Submit laboratory for approval: See Submittals paragraph). The proposed synthetic turf materials must meet the following test requirements and criteria:

1. Infill- Aqueous Test: After infill material is prepared in accordance with EPA Method 1312 Synthetic Precipitation Leaching Procedure (SPLP), a total analysis shall be performed to determine heavy metal content in accordance with either EPA Method 6010 or EPA Method 6020. Semi-volatile organic content shall be determined under Method 8270C and shall include data for aniline (CAS #62-53-3), phenol (108-95-2) and benzothiazole (95- 16-9). Heavy metal content shall not exceed NYS DEC Groundwater Standards. Total lead (Pb) content shall not exceed .025 parts per million (ppm), total Chromium (Cr) content shall not exceed .05 parts per million (ppm), total Zinc (Zn) shall not exceed 2.0 ppm.

2. Carpet Fibers- Solid Digestion Test: After carpet fibers are prepared in accordance with EPA Method 3052 (solid microwave digestion procedure), a total analysis shall be performed to determine heavy metal content in accordance with either EPA Method 6010 or EPA Method 6020. Total lead (Pb) content shall not exceed 100 parts per million (ppm) and the total Chromium (Cr) content shall not exceed 25 parts per million (ppm).

B. G-MAX

1. The manufacturer shall guarantee that (see Submittals) the G-Max rating of the synthetic turf system shall not exceed a reading of 145 at installation and 180 thereafter, as per ASTM F 355, Test Method A, and in accordance with ASTM 1936, for the entire term of the warranty. If readings do exceed 180 within the

warranty period, the manufacturer shall be responsible for whatever measures are required to achieve G-Max ratings below 180, at no cost to the City.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit synthetic turf Work to be performed according to manufacturers' written instructions and warranty requirements. Installation is to occur only when weather is dry. Where gluing of seams is proposed, the temperature must be 46 °F and rising. Do not deliver or install surfacing material if either ambient air temperature or material temperature is below 32 °F. If, in the opinion of the Engineer, weather and climatic conditions are having or will have an adverse effect on installation, Work shall be delayed until the adverse condition has passed.

B. Field Measurements: Verify the existing conditions. Indicate measurements on Shop Drawings.

C. Existing Utilities: Do not disturb or interrupt existing utilities unless permitted in writing by the Engineer and then only after arranging to provide temporary utility services, if required.

PART 2 PRODUCTS

2.01 BASE AGGREGATE

A. Aggregate shall conform to Section 31 05 16 – Aggregates for Earthwork.

2.02 SHOCK PAD

A. A system without a shock pad is NOT acceptable and will be rejected. Pad shall be constructed from a porous cross link, closed cell polyethylene pad made of 90% recycled HDPE (High Density Polyethylene), minimum ten (10mm) millimeters thick, manufactured by Engineered Sportfield Solutions, Baltimore, MD, or approved equal. Shock pad must be free draining.

2.03 SEAM TAPE

A. Shall be as recommended by the manufacturer. All seam tape shall be a minimum of twelve (12”) inches wide.

2.04 SYNTHETIC TURF

A. All components and their installation methods shall be designed and manufactured for use on outdoor athletic fields. The materials as herein specified shall be able to withstand full

climatic exposure, be resistant to insect infestation, rot, fungus and mildew, ultraviolet light and heat degradation. The system shall be composed of non-toxic components. The system shall have the basic characteristic of flow-through drainage allowing free movement of surface runoff through the turf system where such water shall flow directly into the prepared granular base and into the field drainage system as per the Engineer's specifications.

B. Yarn shall be TenCate Tapeslide XP or Shaw High Performance Slit Tape, twisted parallel long-slit polyethylene tape, minimum ten thousand (10,000) denier, 100 micron, one hundred percent (100%) polyethylene non-abrasive fiber, or approved equal. Monofilament fibers are NOT acceptable under this specification. Pile weight shall be between fifty (50) and fifty-two (52) ounces per square yard. The fiber shall be treated with an ultraviolet (UV) inhibitor and guaranteed minimum eight (8) years against UV degradation and fading.

C. Tuft height shall be one and three-quarter (1-3/4") inch long fibers with a minimum of one and one- quarter (1-1/4") inches infill, as necessary to meet required G-max criteria. Turf shall be delivered in minimum twelve foot (12') width rolls of sufficient length to run from sideline to sideline. Turf color shall be Verde, simulating natural grass, unless otherwise shown on the drawings. The backing shall consist of a perforated primary and secondary backing with a minimum drainage rate of 12 inches per hour. Primary backing shall be woven polypropylene. Secondary backing shall include a nonwoven membrane system with polyester additive featuring dimensional stability characteristics, such as "Colback" manufactured by Colbond Nonwovens, Enka, NC, or approved equal.

D. Acceptable turf products are: "Rhino SF50" as manufactured by AstroTurf, Dalton, GA., "PremierXP50" as manufactured by A-Turf, Williamsville, NY, "Classic Eco-E50" as manufactured by Shaw Sports Turf, Calhoun, GA, "Smart Grass" as manufactured by AFS Corporation, Fort Washington, PA, or approved equal. A system without a shock pad is not acceptable and will be rejected. The system must meet all G-max field test requirements.

2.05 GOAL OR PERIMETER PLAYING LINES AND LOGOS

A. Shall be as shown on the Contract Drawings and shall be painted unless inlaid is specifically shown on the Contract Drawings. For primary playing lines, the turf color shall be white. Secondary lines shall be yellow (unless otherwise shown on the drawings). Line painting shall be performed and paid as described in Section 32 12 16 – Asphalt Paving.

2.06 SYNTHETIC TURF INFILL MATERIAL

A. Uniform silica sand: resilient infill shall be coated, sanitary, rounded, uniformly sized sand (silicon dioxide SiO_2) or quartz made from virgin materials for synthetic turf systems. When tested for sphericity and roundness in accordance with the "International standard for measurement of properties of proppants used in hydraulic fracturing and gravel-packing

operations (ISO 13503-2), 2006 or latest version", Section 7, sphericity shall not be less than 0.8, roundness shall not be less than 0.7. Sieve analysis shall show that material meets requirements for sieve sizes as described below but under no circumstances shall more than 3% pass the 30 sieve. Coated or colored sand (only) shall be provided where color is specifically noted on the drawings. Where color is silent on the plans, either coated or uncoated sand is acceptable.

1. Infill shall be one of the following:

   a. Coated or Colored sand: shall be similar to Envirofill infill manufactured by US Greentech, LLC, Cincinatti, OH or Colorbrite SpectraQuartz colored pigmented quartz infill as manufactured by Fairmount Santrol, Chesterland, OH, or approved equal. Size of infill shall be a blend between No.12 to No. 20 mesh size inclusive. Color of coating or pigment shall be green or light tan in color.

2. Tire derived SBR (styrene butadiene rubber) crumb infill product in any percentage will be rejected.

3. Infill shall be low thermal absorption and low thermal capacity. The infill mixture composition proposed for the site shall be submitted for approval prior to installation. The resilient infill shall not exceed specified head injury criteria for the entire 8 year warranty period.

2.07 RECYCLED PLASTIC LUMBER EDGE

A. Synthetic turf shall be attached to a recycled plastic lumber nailer placed around the perimeter of the field and the edges of any cutout areas, as designated on the Layout drawing. The nailer shall be two inch by six inch (2" x 6"). Recycled plastic lumber shall be fabricated from one hundred percent (100%) High Density Polyethylene (HDPE) and Low Density Polyethylene (LDPE) recycled polyethylene, including UV-inhibiting pigment, Molded Grade Plastic Lumber as manufactured by Plastic Lumber Yard, Norristown, PA, PolyForce™ Structural Plastic Lumber manufactured by Tangent Technologies, LLC, Aurora, IL, SelectForce as manufactured by Bedford Technologies, Worthington, MN, or approved equal. Composition and mechanical properties shall be as follows:

Minimum High Density Polyethylene:	70%
Tensile Strength (ASTM D638):	1200 psi
Compressive Strength (ASTM D6108):	1200 psi
Flexural Modulus of Elasticity (ASTM D6109):	95,000 psi
Average Nail Pull Out Strength (ASTM D6117):	280 lbs

B. The Bulk Density and Specific Gravity of the recycled plastic lumber shall conform to the acceptable standards determined by the standard test method in ASTM D6111. Recycled plastic lumber shall not absorb moisture, corrode, rot, warp, splinter, or crack and the surface shall not be slippery when wet. The recycled plastic lumber shall not contain any material that will be irritating when in contact with skin. Cross sections shall not show wide deep gaps or holes. Plastic lumber shall remain unpainted. Lumber is totally below grade and therefore any color or combination of colors is acceptable.

2.08 HARDWARE

A. Hardware for attaching synthetic turf to recycled plastic lumber shall be minimum two (2") inches in length, stainless steel or galvanized and as supplied by the Synthetic turf manufacturer/installer.

2.09 REINFORCING BAR

A. Shall be of the sizes and dimensions shown on the plans. Reinforcement shall meet the requirements of Section 03 30 00 – Cast-in-Place Concrete.

2.10 SEALANT

A. Shall be a one part polyurethane elastomeric sealant, such as Sikaflex 1a, as manufactured by Sika, Lyndhurst, NJ or approved equal. Sealant shall be resistant to water, diluted acids, and alkalis and the color shall match the recycled plastic lumber.

2.11 GEOTEXTILE

Geotextile shall conform to DEP Standard Specifications for On-Site Green Infrastructure 33 44 31 – Stormwater Membrane Filtration

2.12 SLOTTED POLYETHYLENE PIPE

A. Pipe, where shown in Contract Drawings, shall be either full circular cross-section or a slim line drainage system, whichever is shown on the Contract Drawings. A slim line drainage system is a flexible, prefabricated drainage system, with either a series of small interconnected corrugated round pipes or a flat pipe with full horizontal cross-section, wrapped in a non-woven, drainage geotextile. The Contractor shall not have the option of substituting the slim line drainage system where round pipe is shown (or vice versa). The Contract Drawings shall strictly be followed. Pipe and fittings of both types shall be made from high density, virgin PE compounds that conform to the requirements of cell Class 324420C, as defined and described in ASTM D3350.

B. Slim line drainage system manufactured for this specification shall comply with the requirements for test methods, dimensions, and markings found in AASHTO Designations M288. Slim line drainage pipe and fittings shall be Multi-Flow Drainage Systems as manufactured by Varicore Technologies, Inc., Prinsburg, MN, or AdvanEdge pipe as

manufactured by Advanced Drainage Systems, Inc., Ludlow, MA, or approved equal. The slim line drainage system shall be eighteen (18”) inches in width with an outer corrugated perforated pipe wall.

C. Circular pipe manufactured for this specification shall conform to Section 33 42 11 – Stormwater Gravity Piping.

2.13 SOCK

A. Circular perforated pipe, where shown in Contract Drawings, shall have a "DC Sock", a polyester machine knitted envelope factory applied and ready for installation, or wrapped in non-woven geotextile fabric. Sock and fabric shall meet specifications of non-woven geotextile (Section 33 44 31 -
Stormwater Membrane Filtration). Sock not required for the slim line drainage system.

2.14 FITTINGS

A. The fittings shall not reduce or impair the overall integrity or function of the pipeline. Fittings may be either molded or fabricated. Common corrugated fittings include in-line joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as tees, wyes, and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Coupling of the pipes shall be performed using Standard ADS (Advanced Drainage Systems) N-12 split coupler PRO LINK ST, or PRO LINK 10.8, or PRO LINK 5, or approved equal. Only fittings supplied or recommended by the pipe manufacturer shall be used. Where designated on the plans, a neoprene or rubber gasket shall be supplied.

2.15 STONE SCREENING SETTING BED

A. Material shall be chosen to be consistent with the specifications and warranty requirements of the Shock Pad and Turf manufacturers.

2.16 GEONET

A. Shall be placed beneath the aggregate base of all synthetic turf areas to provide separation between the base aggregate and subgrade soils. The Geonet shall be made of polyester yarns with tensile strength of no less than 3600 lbs/ft (by ASTM D6637), creep strength of no less than 2323 lbs/ft (by ASTM D6992/D5262), and aperture size of not more than 0.75 inches. Product shall be the Stratagrid SG200 as manufactured by Strata Global Solutions of Cumming, GA, or approved equal.

2.17 FLUSH CONCRETE CURB

A. Shall be of the sizes and dimensions shown on the plans. Concrete and reinforcement shall meet the requirements of Section 03 30 00 – Cast-in-Place Concrete.

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SECTION 32 18 13

SYNTHETIC GRASS SURFACING

PART 3 EXECUTION

3.01 INSTALLATION

A. It shall be the responsibility of the Contractor/installer to inspect and certify that the base is ready for the installation of the turf system, and when satisfied with its condition the Contractor/installer shall notify the Engineer in writing of this acceptance.

B. Excavation of areas to receive synthetic turf shall be performed in accordance with the Section 31 23 16 – Excavation.

C. The area to receive the resilient artificial turf shall be excavated to the correct depth, including peripheral drainage trenches, where shown in Contract Drawings for slotted polyethylene pipe. The subgrade shall be laser graded to a 0% slope across the entire field area as indicated on the Contract Drawings, and all finished subgrade elevations verified with laser leveling instruments. The Contractor shall be careful to avoid over excavation. The geotextile shall be rolled directly over the prepared subgrade and the peripheral drainage trench, where shown in Contract Drawings, overlapping all seams a minimum of six inches (6") in all directions. The sidewalls of the excavated areas that are to be filled with aggregate shall be lined with geotextile as shown in the Contract Drawings. To maintain proper infiltration, compacting the insitu soils as well as the use of heavy machinery within the synthetic turf field footprint is strictly prohibited

D. SURPLUS: Excess material excavated by the Contractor shall be legally disposed of at the Contractor's expense.

E. All slotted polyethylene pipe, where shown in Contract Drawings, shall be laid in reasonably close conformity to line and grade and shall have a full, firm, and even bearing at each joint and along the entire length of pipe and surrounded with the base aggregate drainage material, in accordance with the plans, specifications, and directions of the Engineer. Joint misalignment shall not result in offsets, in the interior smooth liner, greater than one-quarter inch (^{1}/4"). Pipe laying shall begin at the downstream end and progress upstream. Any single run of pipe, excluding end sections, shall consist wholly of the same type material unless otherwise directed by the Engineer. No section of pipe used shall be less than three feet (3') in length. Installation of the pipe shall be in accordance with ASTM Recommended Practice D2321. Connection(s) to drainage system (pipes or structures) shall be deemed included in the price bid for this item.

F. Recycled Plastic Lumber Edging shall be installed around the perimeter of the field area and the clay cutout areas (if any) on a prepared level surface and drilled to receive the steel reinforcing rods, the rods hammered in place to one-quarter inch (^{1}/4") below the lumber surface and the void filled with approved sealant.

G. The base aggregate shall be installed in three (3) two (2") inch lifts over the geotextile and compacted to a ninety percent (90%) Proctor Density. The base aggregate must be free

draining, consistent with the vertical draining requirements of the synthetic turf manufacturer, and the surface of the field shall be graded according to the Contract Drawings, in such a manner that the finished field edges meet flush with the hard perimeter. The Contractor shall employ laser leveling devices to determine the correct subgrade and finished grade elevations of base aggregate. If required, the stone screening setting bed shall be installed over the base aggregate according to manufacturer's specifications.

H. Prior to beginning installation, the installer of the synthetic turf and pad shall inspect the subbase and supply a Certificate of Subbase Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface. **The synthetic turf manufacturer's representative and the Engineer must approve the permeable base aggregate installation prior to installation of the synthetic turf.**

I. The shock pad shall be installed directly over the properly prepared base aggregate or stone screening setting bed as specified by the manufacturer. The Contractor shall take extreme care to prevent disturbance of the base aggregate in regard to compaction and planarity. Any disturbed areas shall be rerolled with a four to six (4~6) ton roller, to the satisfaction of the Engineer.

J. The full width rolls of turf shall be laid out across the field and the edges attached to the recycled plastic lumber perimeter attachment with a nail gun, or as per manufacturer's directions, at maximum six inch (6") intervals. Head seams, other than at sidelines, shall not be acceptable. Slits in the fabric to relieve such defects are not permitted.

K. Seams

1. Adhesive installations shall be glued down with minimum twelve (12") inch wide textured seam tape. Adhesive shall be applied to entire width of seam tape. Sewing, where used shall have stitches every one-quarter (1/4") inch or less. Thread shall be polyester or nylon, color to be green.

2. All seams shall be transverse to the field direction; i.e., run perpendicularly across the field. Seams shall be flat, tight, and permanent with no separation or fraying. Permanent playing lines (where shown) shall be laid out and incorporated in the turf as shown on the Contract Drawings. Drains shall be marked on the surface with an inlaid white dot two inches in diameter. Perimeter edge details required for the system shall be as shown on the Contract Drawings, as recommended by the manufacturer, and as approved by the Engineer.

3. Synthetic turf adhesive shall be one of the following:

   a. A solvent based, one-part, thixotropic high green strength urethane, similar to NORDOT #34G as manufactured by Synthetic Surfaces, Inc. Scotch Plains, NJ.

   b. A two component, thixotropic polyurethane based adhesive manufactured specifically for use on synthetic turf, such as STA-1000 Synthetic Turf Adhesive

as manufactured by Sports Turf Direct, Finleyville, PA, or Ultrabond TurfPU 2K as manufactured by MAPEI, Deerfield Beach, FL.

c. Or an approved equal.

4. Rate of application shall be a maximum of thirty (30) linear feet of seam tape per gallon of adhesive unless otherwise recommended by the manufacturer. Hot melt glue is NOT acceptable as an approved equal adhesive. Seams shall be compressed after glue application using a one ton roller or equivalent. Roll each seam a minimum of two times to ensure adhesion.

L. Installing Infill

1. The completed synthetic turf field shall be brushed with a motorized nylon rotary broom and the infill material immediately installed with a minimum four-foot (4') width drop spreader. The infill shall be applied in a minimum two (2) lifts to one and one-quarter inch (1-1/4") depth, totaling nine pounds per square foot (9 lbs/sf) of infill material, and the infilled area brushed between each lift. The area shall be wetted as necessary during installation to minimize dust.

M. Follow-Up Visits

1. The Contractor shall prepay the resilient synthetic turf manufacturer for two (2) follow-up visits at six-month (6 mo.) intervals after the Final Inspection date. The visits shall be scheduled by the Resident Engineer to inspect the condition of the synthetic turf, infill material, drainage system, clay skinned areas (if any), and peripheral attachments. Items found to require repair, amendment, or replacement shall be the responsibility of the Contractor. Repairs, except those due to vandalism, shall take place immediately upon notification by the Resident Engineer.

3.02 CLOSE-OUT REQUIREMENTS

A. Prior to Final Acceptance, the Contractor shall submit to the Owner three (3) copies of Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and striping.

B. The Contractor shall provide evidence that the turf can be plowed with conventional rubber bladed snow removal equipment.

C. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types. The finished surface shall resist abrasion and cutting from normal use.

3.03 CLEAN-UP

A. At the completion of the Work, remove all material scraps, debris, and equipment from the Site and leave the filled synthetic turf area ready for use.

B. All usable remnants of new material shall become the property of DEP.

C. Surfaces, recesses, enclosures, etc., shall be cleaned as necessary to leave the Work area in a clean, immaculate condition ready for immediate occupancy and use by DEP.

3.04 ACCEPTANCE

A. Before the acceptance of the Work, should any imperfect areas or spots develop in the surface, such areas shall be removed and replaced with new materials.

B. All such repair Work shall be done at no additional cost to the City.

C. G-Max Test successfully completed.

END OF SECTION

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SECTION 32 31 15
CHAIN LINK FENCE

PART 1 GENERAL REQUIREMENTS

A. This section describes the requirements for fences in the form of chain link fences and gates for this Project. The Contractor shall furnish and erect powder coated chain link fences and powder coated chain link fence gates of the heights and sizes shown on the Contract Drawings, in accordance with the plans and specifications and directions of the Engineer.

B. Fences shall effectively enclose the areas shown on the plans, and when new fences terminate at existing or new structures or fences within the areas or adjacent to the areas, the clear spaces between the fences and structures shall not exceed three and one half (3 1/2") inches. Closures, if necessary, shall be made by the Contractor in a manner approved by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 23 16 – Excavation

C. Section 03 30 00 – Cast-in- Place Concrete

1.03 PAYMENT

A. The price bid shall be a unit price per SQUARE FOOT of CHAIN LINK FENCE and shall include the cost of all labor, material, equipment and all incidental expenses necessary to complete the work, including concrete footings, painting, disposal of excess materials, gates, powder coating and powder coating touch-up, and all other incidentals required to furnish and erect chain link fence, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The price bid shall be a unit price per SQUARE FOOT of CHAIN LINK FENCE GATE and shall include the cost of all labor, material, equipment and all incidental expenses necessary to complete the work, including concrete footings, painting, disposal of excess materials, gates, powder coating and powder coating touch-up, and all other incidentals required to furnish and erect chain link fence gate, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

B. ASTM A123 Standard Specification for Zinc Coating (Hot-Dip Galvanized) Coatings on Iron and Steel Products

C. ASTM F-1083 Standard Specification for Pipe, Steel, Hot Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

D. ASTM A1011/A1011M Standard Specification for Steel, Sheet and Strip, Hot- Rolled, Carbon, Structural, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

E. ASTM F1043 Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework

F. ASTM F668 Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. All submittals shall be in accordance with the requirements of the Section 01 33 00 – Submittal Procedures.

B. Certification:

The Contractor shall submit, at his own expense, a certification from the supplier for the following:

1. All castings are made from malleable iron.

2. All hot-dipped galvanized items have met the ASTM serial designations as indicated in this specification.

3. All powder coating meets the ASTM serial designations as indicated in these specifications.

C. Shop Drawings:

Before the work in the shop is started, the Contractor shall submit shop drawings for approval. Include complete details of fence and gate construction, fence height, post spacing, dimensions and unit weights of framework and concrete footing detail. A shop drawing shall be submitted for the Gate Locking System showing all three elements, a steel drop bolt, a rotating locking mechanism and gate stops.

D. Samples:

Prior to erection of the fence the following shall be submitted:

1. Fence framework: One piece of each pipe size, twelve inches long.

2. Fence Fabric: One piece twelve inches square.

E. Shipping Lists:

The shipping list for the materials furnished shall be endorsed with the manufacturer's voucher certifying that the materials used comply with these specifications.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 GENERAL

A. All fittings, hardware and equipment shall be designed to carry one hundred percent (100%) overload.

B. Malleable iron castings shall be powder coated after hot dipped galvanizing in accordance with ASTM Serial Designation: A153.

C. Pressed steel fittings and appurtenances shall be powder coated after hot dipped galvanizing in accordance with ASTM Serial Designation: A123.

D. All fittings, hardware and equipment shall be powder coated of a color to match the framework and shall be of the materials listed in the following schedule:

Fence/ Gate Part	**Material**
Boulevards, Corner (Split) Fittings and End Fittings	Malleable Iron or Pressed Steel-3/16" thick Fittings and End Fittings
Post Caps and Post Line Tops	Malleable Iron or Pressed Steel-3/16" thick Fittings and End Fittings
Couplings	Galv. Steel Pipe - 1/8" thick with 1/4" Dia. Full Depth Rivet
Gate Hinges	Malleable Iron or Pressed Steel-1/4" thick with 1" Dia. Stainless Steel Pin Welded to 1/2" thick Pin Support
Bolts and Nuts	Galv. Steel or Stainless Steel as indicated on Plans
Tension Bars	1/4" x 3/4" Galv. Steel for 2" and 1-3/4" Mesh, 3/16" x 3/8" Galv. Flat Steel for 1” Mesh
Tension Bands	1/8" x 1" Pressed Steel

Truss Rods	1/2" Dia. Galv. Steel
Truss Tightener	3/8" x 1" Galv. Steel
Truss Clamp	1/4" Pressed Steel
Gate Locking System	Rotating Locking Mechanism– Galv. Steel pipe. All other components shall be mild steel.
Gate Stop	7/16” thick malleable iron
Drive Pins and Set Screws	Stainless Steel, 18-8

2.02 POSTS AND RAILS:

A. TYPE I: This shall be standard weight galvanized steel pipe of the sizes shown on the plans and shall conform to ASTM Serial Designation F-1083 Schedule 40, except for chain link fence posts 20'-0" height, which shall be Schedule 80. Posts and rails shall be hot dip galvanized inside and outside in accordance with ASTM Serial Designation F-1083 or:

B. TYPE II: For fence up to and including ten feet height, posts and rails may be TYPE II, SS-40 steel tubing as manufactured by Allied Tube and Conduit Corp. of Harvey, Illinois, or approved equal. Tubing must conform to ASTM A1011/A1011M, cold rolled steel pipe and coated with a minimum of 0.9 ounces of zinc per square foot, a minimum of 15 micrograms of zinc chromate per square inch. Steel pipe supplied under this option shall be of the same outside diameter as Schedule 40 pipe and achieve minimum yield strength of 50,000 p.s.i.

2.03 SURFACE COATINGS

A. All posts, rails and fittings shall be powder coated with either polyvinyl chloride (PVC) or TGIC-Polyester (with the exception of the turnbuckles and threaded ends of the truss rods, both of which shall be sprayed with powder coat touch-up after installation).

B. Galvanizing of all components shall provide an acceptable substrate for applied powder coatings. No lacquer, urethane or other coatings which would prevent proper adhesion of powder coating shall be applied to the pipe.

C. The powder coating shall be applied to the galvanized surfaces in such a manner that the coating will not peel off. Ensure surfaces to be coated are clean and dry and free of grease, dust, rust, etc. All galvanized parts, prior to powdercoating, shall first receive phosphating and chromatizing treatments to improve the adhesion of the surface coating. Color to be black unless otherwise indicated on the plans.

D. The entire fence installation shall be coated with one of the two following types of powder coating, (with the exception of gates, all of which shall be TGIC-Polyester and fabric which shall always be PVC). All Fence components shall be coated on all surfaces, of a color to match the framework. All coated surfaces shall comply with the adhesion specifications listed in ASTM F1043.

1. TYPE A - Polyvinyl Chloride Powder Coating:

   PVC Powder coating shall be applied to the galvanized steel or iron by the fluid bed method to a preheated base which has been cleaned and primed prior to submersion in vinyl, resulting in a firm bond between the PVC and the metal. PVC shall be applied to a film thickness of 10 to 15 mils on framework and fittings, and 7 to 12 mils on fabric without voids, tears or cuts that reveal the substrate and shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

2. TYPE B - TGIC-Polyester Powder Coating:

   TGIC-Polyester Powder shall be applied to the galvanized steel or iron in such a manner that the coating will not peel off. The TGIC-Polyester shall be applied at a film thickness of 3 to 6 mils by electrostatic spray process and bake finished per manufacturer's directions. The TGIC-Polyester shall be applied without voids, tears or cuts that reveal the substrate and shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

2.04 FABRIC

A. This Fabric shall be hot dip galvanized steel wire mesh as per ASTM A641, with a thermally fused polyvinyl chloride powder coating of 7 to 12 mils thick as per ASTM F668 class 2b. Color to match framework. Fabric shall be produced by methods recognized as good commercial practices. Core wire tensile strength shall be 75,000 psi (517 MPa).

B. Wire used for the manufacture of fabric shall meet the requirements of ASTM F668 and shall be capable of being woven into fabric without the PVC coating cracking or peeling. PVC coating shall be a dense, impervious covering free of voids. Excessive roughness, bubbles, blisters, bruises and flaking will be a basis for rejection. PVC shall be thermally fused. Bonded or extruded and glued surface coating will not be permitted. Fabric shall be stretched to provide a smooth, taut, uniform appearance free from sag.

C. Field Test:

PVC coating on fabric shall be field tested for adherence to the metal as outlined elsewhere in this specification.

D. Thickness of Fabric: One Inch Mesh:

Uncoated wire dimension shall be 0.120 inches in diameter (11 gauge). Zinc coating shall be 0.30 ounces per square foot of wire surface.

E. One and Three Quarter Inch and Two Inch Mesh:

Uncoated wire dimension shall be 0.148 inches in diameter (9 gauge). Zinc coating shall be .3 ounces per square foot of wire surface.

F. Selvages:

Fabric shall be barbed at the top and knuckled at the bottom on fences over 6'-0" high. Fabric on fences 4'-0" and 6'-0" shall be knuckled top and bottom. Loops of knuckled fabric shall be closed or nearly closed. The wire ends of barbed selvages shall be twisted in a closed helix of 1- matching turns and cut at an acute angle. The length of the ends beyond the twist shall be at least 1/4-inch long. One inch mesh shall be knuckled both top and bottom.

2.05 TIES

A. Tie-wire core thickness shall be 9 gauge (0.148") wrought aluminum alloy 1100-H16 wire with an extruded vinyl coating in accordance with ASTM A641 Class 3. PVC shall be applied to a film thickness of 20 to 22 mils. Ties shall be spaced fifteen (15) inches apart on rails and twelve (12) inches apart on posts. The ends of ties shall be wound in a telegraph twist two and one-half turns.

B. Color to match mesh. Contractor shall touch-up PVC coating on ties damaged as result of installation.

2.06 GATES

A. Gates shall be furnished and installed on reinforced concrete slabs where indicated on the plans or directed by the Engineer. All gates shall be galvanized steel and shall be TGIC-Polyester powder coated after fabrication per requirements for fence framework outlined elsewhere in this specification. Welded joints shall have a suitable rust preventive coating applied to the welds prior to powder coating. Gate fabric shall match line fabric adjacent to gate opening. Gates shall be installed plumb, level and secure for full opening without interference. The hinges shall be so designed to permit the gate to swing a full 180 degrees.

B. Gate locking system shall be fabricated in accordance with the Standard Details and shall be manufactured by Shannon Gates and Railings, Deer Park, NY, or approved equal. The Gate Locking System shall consist of three elements: 1) A steel drop bolt arranged to engage the gate stop. The drop bolt shall have a flange that meets a fixed locking eyelet, welded on the gate, to lock the gate in the open and closed position. 2) A rotating locking mechanism consisting of flanges that can be padlocked together and 3) gate stops. All

necessary fittings and gate holders to lock gates in both open and closed position shall be furnished. The gate locking system shall be installed to face the fenced in area, unless otherwise directed by the Engineer. All welds shall be ground smooth to a neat finish.

C. The Contractor shall furnish one (1) padlock for each single gate and for each leaf of the double gates. The padlocks shall be American No. 5571 as manufactured by the American Lock Co. or Crete, Illinois, or approved equal. All padlocks for the same park facility shall be keyed alike, with two (2) inch with by three-quarter (3/4) inch thick brass body, maximum security, five (5) pin tumblers with hardened alloy steel chrome plated shackle no less than three-eights (3/8) inch diameter and two (2) inch clearance (elongated shackle). The Contractor shall furnish two (2) keys for each padlock.

2.07 REINFORCED CONCRETE SLAB

A. At gates shall be shown on the standard details and as specified under "Reinforced Concrete Pavement".

B. Concrete shall be 3,200 psi Average Concrete.

PART 3 EXECUTION

3.01 ERECTION

A. The posts shall be set in holes which shall have been formed in the concrete curb as shown on the plans or directed by the Engineer. Voids for posts shall be formed in the concrete by removable waxed sonotubes or galvanized sheet metal sleeves to remain. Core drilling is not permitted. After the posts have been set in place and properly supported to hold them in line and grade, the resulting space shall be neatly filled with a grout consisting of one part cement and two parts sand or approved equal. Cement and sand shall meet requirements found in DEP Standard Specifications for On-Site Green Infrastructure 03 30 00 – Cast-in-Place Concrete. All gates and all end, corner and gateposts, regardless of height of fence shall have a 1/2" diameter truss rod and turnbuckle. Rod shall be tied to the mesh every 12 inches on center with tie-wires. Bolts on the turnbuckle shall be tack welded to prevent loosening. The only exception to the above is that truss rods are not required for end, corner and gateposts for fences 4'-0" ht. and under.

B. Chain link fabric shall be attached to line and corner posts and top, intermediate and bottom rails. Maintain a min. one-inch clearance between finished grade and fence fabric. Posts shall be set plumb and true to line and grade. Any post not set true to line and grade shall be removed and replaced at the Contractor's expense. Bending posts to make them plumb will not be permitted.

C. The Contractor shall maintain the chain link fences and gates during the life of the contract and shall repair and replace all members that are disturbed, damaged, or destroyed from any cause at no cost to the City.

D. Bolt and HardwareInstallation:

Nuts and bolts shall be galvanized but not powder coated. Cans of TGIC-Polyester or PVC touch-up powder coating shall be used to paint the nuts and bolts per manufacturer's recommendations. The ends of all bolts shall be peened aftertightening.

E. Bolts which are installed six feet or less above grade shall not protrude more than 1/4" beyond the nut after tightening. All rough edges resulting from the cutting of bolts to achieve this requirement shall be filed smooth to the satisfaction of the Engineer. All post caps, corner and end fittings, and gate hinges on all fence elevations are to be secured in place with #14 SS drive screws to the satisfaction of the Engineer.

3.02 TESTS

A. This Field Test for PVC Powder Coating:

As per ASTM F668, three sample sections of the PVC powder coated fence shall be tested for bonding of the powder coat to the metal. Each test will consist of making two cuts parallel to the axis of the pipe or fitting, through the coating, appx. 1/16 inch (1.6 mm) apart, at least 1/2 inch (12.7 mm) long. With a knife peel back a section of the coating between 1/8 inch (3.2 mm) and 1/4 inch (6.4 mm) long to produce a tab. Attempt to remove the 1/16 inch strip of coating by pulling the tab. The fence shall be deemed acceptable if the coating breaks rather than separates from the metal on all three samples.

B. Laboratory Test for TGIC-Polyester Powder Coat:

At the discretion of the Engineer, a sample of the TGIC-Polyester powder coated fence shall be laboratory tested for bonding of the powder coating to the metal. Test shall be the Cross-Hatch test per ASTM D3359, Method B. Failure to satisfactorily pass this test shall be a basis for rejection

3.02 TOUCH-UP & REPAIR:

For minor damage caused by installation, transportation, field welding and cutting of metal powder coated surfaces: clean welds, bolted connections, abraded or sawcut areas, then:

1. On welded and cut surfaces, apply organic zinc repair paint complying with ASTM A780, then repair powder coating per number 2 below. Galvanizing repair paint shall have 65 percent zinc by weight. Thickness of repair paint shall be not less than that required by ASTM A123.

2. On damaged powder coated surfaces, touch-up finish in conformance with manufacturer's recommendations. Provide touch-up such that repair is not visible from a distance of six feet.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 31 19
DECORATIVE METAL FENCES AND GATES

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under these Items, the Contractor shall furnish and erect STEEL FENCES and GATES of the types and sizes shown on the plans, in accordance with the plans, specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 03 30 00 – Cast-in-Place Concrete

C. Section 31 00 00 – Earthwork

D. Section 05 05 23.02 – Miscellaneous Metal Fastenings

E. Section 01 14 00 – Work Restrictions

1.03 PAYMENT

A. The prices bid shall be unit prices per SQUARE FOOT of STEEL FENCE and shall include the cost of all labor, materials, and equipment required to furnish and erect fences and gates, including foundations, painting, post removal and filling, disposal of excess material, installation, painting, grout, sealant, and all incidental expenses necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The prices bid shall be unit prices per SQUARE FOOT of STEEL FENCE GATE and shall include the cost of all labor, materials, and equipment required to furnish and erect fences and gates, including foundations, painting, post removal and filling, disposal of excess material, installation, painting, grout, sealant, and all incidental expenses necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

C. The prices bid shall be unit prices per LINEAR FOOT of STEEL WICKET FENCE of each type and shall include the cost of all labor, materials, and equipment required to furnish and erect fences and gates, including foundations, disposal of excess material, installation, painting, grout, sealant, and all incidental expenses necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

D. The prices bid shall be unit prices per LINEAR FOOT of STEEL GUIDE RAIL and shall include the cost of all labor, materials, and equipment required to complete the work including site restoration, minor pavement restoration, hardware splice plates, and all incidental expenses necessary to complete the work in accordance with the plans and

specifications, to the satisfaction of the Engineer. (Anchorage unit, steel rail and posts are considered part of the linear foot price for this item.)

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM A36

B. Federal Specification TT-P-86H, Type III and IV, and TT-P-664D

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. All submittals shall be in accordance with the requirements of the Section 01 33 00 – Submittal Procedures.

B. Shop Drawings:

Shall be submitted prior to manufacture.

C. SAMPLES:

The Contractor shall submit for the approval finished samples of parts of the fences. The workmanship and finish of the final product shall be equal to the approved samples. Only if proposed manufacturer is other than as specified, a full-size sample must be submitted for approval for the following: Gate latch for single gate, padlock, cast iron parks leaf.

D. FOUNDRY CERTIFICATE:

A certificate verifying the quality of ductile iron for the Parks Leaf shall be submitted. Certificate shall be on Manufacturers' letterhead, dated and signed by the company President with Contract Number, Contract Title, Contractor Name, and Class of Ductile Iron provided.

E. PAINT SUBSTITUTION:

A written request for paint substitution must be submitted to the Engineer for review and approval. The Contractor shall submit this request, along with manufacturer's data sheets for approval, a minimum of two weeks prior to the intended date of paint application. All paint substitutions must be approved in writing prior to use.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 FENCES AND GATES

Shall be constructed of solid bars, posts, and rails of the sizes shown on the plans unless specifically noted as lightweight. All material shall conform to Specification ASTM A36.

2.02 FABRICATION- LIGHTWEIGHT GATE (where specified only)

Shall be as manufactured by Shannon Gates and Railings, Deer Park, NY, or approved equal and shall be fabricated from 16 guage square tubing and 1/2" channels.

2.03 FABRICATION-STEEL FENCES AND GATES

A. Fences and Gates shall be fabricated in strict accordance with the plans and approved Shop Drawings. Posts and rails shall be formed into panels of the shapes on the plans and joints completely welded with welds of proper size and shape; all welds ground smooth to a neat finish. Connection shall be provided as indicated on the plans. Welding shall conform to the requirements given under the 05 05 23.02 – Miscellaneous Metal Fastenings.

B. Posts and pickets shall, in all cases, be truly vertical. Rails and bars shall be parallel to grade as shown on the plans. Panels shall be curved as required by the work. Braces shall be required at two-thirds of the way up each post when fence is ten feet high or over.

2.04 HINGES

Shall be Stanley #BB855, Heavy Duty Steel Ball Bearing Hinge, 5" x 6", as manufactured by Stanley Hardware, New Britain, CT or approved equal.

2.05 LOCK BOLT - DOUBLE GATES

Lock bolt shall be a drop rod bar arranged to engage the gate stop. Locking device shall be constructed so that the drop rod cannot be raised when the gate is locked. The locking bolt and bolt catch hardware shall be constructed as shown on Parks Standard Details. The locking device shall have provisions for a padlock. All necessary fittings and gate holders to lock gates in both open and closed positions shall be furnished.

2.06 GATE LATCH – SINGLE GATES

Shall be a lockable stirrup type. Latch shall be constructed of steel bars and blocks with a stainless-steel pin, as shown on the drawings. The ends of stirrups shall be treated with a heavy-duty flexible, rubberized coating such as Plastidip as manufactured by P.D.I. Inc., Blaine, MN, or approved equal.

2.07 PADLOCK WITH CHAIN

The Contractor shall furnish to NYC Parks Borough Maintenance and Operations one padlock for each single gate and each leaf of double gates. The padlocks shall be American No. A5571 as manufactured by American Lock Co., Crete, IL., or approved equal. All padlocks for the same park facility shall be keyed alike, with two-inch wide by three-quarter inch thick brass body, maximum security, five pin tumblers with hardened alloy steel chrome plated shackle no less than three-eighth inch diameter and two-inch clearance (elongated shackle). A galvanized steel chain, nine inches long shall be fastened to the gate and body of the lock. The chain shall be five-sixteenths inch by one and three-eighths inch. The Contractor shall furnish two keys for each padlock.

2.08 CAST IRON PARKS LEAF –DOUBLE GATES

A. The Park Leaf casting shall be as manufactured by Wemco Castings, Bohemia, N.Y, or approved equal. The D.P.R. retains exclusive right to the use of the pattern. Leaf castings are to be fabricated from Ductile Iron 65-45-12. The small 9 1/2" leaf shall weigh approximately six pounds each. The back of the leaf casting is to be flat and the front face shall be contoured with the veins of the leaf shown in relief. See Contract Drawings for structural details.

B. Park leaves shall be welded to each leaf of the steel gate in the shop. Field welding will not be permitted.

2.09 GROUT

Grout for fence posts shall be non-shrink, cement based grout such as Fluid Grout 100, as manufactured by Five Star Products, Inc., Shelton, CT or SikaGrout 212, as manufactured by Sika Corporation, Lyndhurst, NJ, or approved equal.

2.10 SEALANT

Sealant around fence post shall be one-part polyurethane, elastomeric adhesive such as MasterSeal CR 195, as manufactured by BASF Building Systems, Shakopee, MN or Sikaflex-1a, as manufactured by Sika Corporation, Lyndhurst, NJ, or approved equal.

2.11 PAINTING

A. The fences and gates shall receive three (3) coats of paint. The first coat shall be shop applied; the second and third coat shall be field applied. Immediately prior to painting, all surfaces of fences and gates shall be thoroughly cleaned in accordance with guidelines recommended by the Society for Protective Coatings (SSPC), or equivalent as detailed below. All surfaces that are rust free shall be treated in accordance with SSPC-SP1, Solvent Cleaning. Treatment shall be performed with a solvent such as mineral spirits, xylol, or turpentine to remove all dirt, grease, and foreign matter. Surfaces that show evidence of scale and rust shall be cleaned in accordance with SSPC-SP2, Hand Tool Cleaning, a

method generally confined to wire-brushing, sandpaper, hand scrapers, or hand impact tools or SSPC-SP3, Power Tool Cleaning, a method generally confined to power wire brushes, impact tools, power sanders, and grinders in order to achieve a sound substrate. After the fence and gates have been cleaned and prepared, they shall be painted as follows:

1. First Coat (Shop Applied): Waterborne Bonding Primer V175 as manufactured by Benjamin Moore & Co., Montvale, NJ, or Pro-Cryl® Universal Primer, B66-310, Red Oxide, acrylic primer, as manufactured by Sherwin Williams Company, Woodside, NY, or approved equal. Primer shall be a fast drying, 53 to 61% weight solids, low VOC, rust inhibiting, modified alkyd metal primer with a dry film thickness of 1.7 - 5 mils. Paint requires up to two (2) to two and a half (2 1⁄2) hours drying time before recoating (with alkyds).

2. Second Coat and Third Coats (Field Applied): Alkyd Urethane Enamel Gloss CV200, Safety Black, as manufactured by Benjamin Moore & Co., Montvale, NJ, or Pro Industrial Water Based Alkyd Urethane Enamel, as manufactured by Sherwin Williams Company, Woodside, NY, or approved equal. Color to be Black unless otherwise shown on the contract drawings. Topcoat shall be a silicon alkyd, low VOC, semi or high gloss coating having a dry film thickness of 1.–4 – 2.1 mils. Paint requires up to twelve (12) hours drying time @ 77o F. Paint adhesion shall be at least 95% retention in accordance with ASTM D3359, classification 4B.

B. All paints shall be applied when ambient air temperature is fifty degrees F. and rising and when surfaces to be painted are moisture free. No painting will be allowed below the minimum ambient air temperature. In addition, no painting will be allowed below the temperature at which moisture will condense on surfaces. Refer to the Dew Point Chart in Section 01 14 00 – Work Restrictions to find the minimum allowed moisture free temperature.

PART 3 EXECUTION

3.01 INSTALLATION

A. The fences shall be erected in holes that have been formed in the concrete or stone to receive them. After the posts have been set in place and properly supported to hold them in line and grade, the annular space shall be filled with the specified non-shrink, cementitious grout. The grout shall be flush with the concrete curb. After the grout has cured, the Contractor is to install polyurethane sealant around the fence post. Sealant shall be gunned in between the base of the fence post and the concrete curb. Sealant shall be applied in strict accordance with the manufacturer’s instructions and shall be tooled in as required. Note: <u>All gypsum (Calcium Sulfate, CaSO4) based grout will be rejected.</u>

B. Any fences and gates not set plumb and true to line and grade shall be removed and replaced at the Contractor's expense. The Contractor shall maintain the fences and gates during the life of the contract and shall repair replace all members that are disturbed, damaged, or destroyed.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 31 29
TIMBER BARRIER RAIL

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes the requirements for TIMBER BARRIER RAIL. The Contractor shall furnish and erect timber barrier railing and necessary excavation and backfill in accordance with the plans and specifications and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 00 00 – Earthwork

C. Section 03 30 00 – Cast-in- Place Concrete

1.03 PAYMENT

A. The price bid shall be a unit price per LINEAR FOOT of TIMBER BARRIER RAIL TYPE B and shall include preservative treatment, unclassified excavation, backfilling, bagged stone, cut and peen of bolts, and all other incidentals required to furnish and erect timber barrier rail, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. The price bid shall be a unit price per LINEAR FOOT of TIMBER BARRIER RAIL TYPE C (DOUBLE RAIL) and shall include preservative treatment, unclassified excavation, backfilling, bagged stone, cut and peen of bolts, and all other incidentals required to furnish and erect timber barrier rail, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

ASTM 307A Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.

1.05 REGULATORY COMPLIANCE

A. New York City Department of Transportation (NYCDOT) Standard Highway Specifications.

B. American Wood Protection Association (AWPA) Standards.

C. New York State Assembly Bill A102.

D. New York State Senate Bill S7167.

1.06 SUBMITTALS

A. All submittals shall be in accordance with the requirements of the Section 01 33 00 – Submittal Procedures.

B. Wood Treatment Affidavit:

The Contractor shall provide, at his own expense, a sworn affidavit as to the type, grade and quality of preservative treatment provided, and the net final retention in pounds per cubic foot of wood impregnated all conforms to the requirements of the specifications.

C. Shop Drawings:

The Contractor shall submit shop drawings and catalog data, if necessary, in accordance with the requirements of Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 GENERAL

A. All timber posts and rail shall be manufactured by MCM Forest Products, Hoboken, New Jersey, or approved equal.

2.02 POSTS AND RAILS

A. Shall be manufactured of No. 1 common Douglas Fir or Yellow Pine. The posts and rails shall be manufactured in accordance with the details shown on the plans. All exposed corners and faces shall be free from damage, dog holes, and pike or cant holes.

2.03 HARDWARE

A. All hardware shall be hot-dipped galvanized and shall include bolts with necessary nuts and washers, timber connectors, nails and other metal fastenings. Bolts and nuts shall conform to ASTM A307.

2.04 BROKEN STONE

A. Each post shall be supported by a foundation of broken stone as shown on the standard detail. Recycled concrete aggregate, three-quarter (3/4) inch blend in a burlap bag is acceptable.

2.05 PRESERVATIVE TREATMENT

A. All wood components shall be pressure preservation treated in strict accordance with the provisions of the AWPA Standards, use Category 4A "Ground Contact" or higher, where noted in the plans. Wood shall be seasoned, either by air-drying or kiln drying, and the moisture content prior to treatment shall be not more than 25 percent. Wood shall be treated to a net retention of 0.40 pounds per cubic foot with ACQ (ammoniacal copper quaternary), or a net retention of 0.15 pounds per cubic foot with Copper Azole- type C preservation or approved equal. The preservation shall penetration 2.5 inches or 85 percent of the sapwood. All details of treatment methods, quality, control and product testing shall be in accordance with the appropriate AWPA Standards. In accordance with New York State Environmental Conservation Law section 37-109, CCA (chromated copper arsenate) treatment is prohibited as a wood preservative treatment material.

B. If any other preservative treatment is proposed, the Contractor shall submit documentation that such treatment conforms to the AWPA Standards for treatment of the wood for the intended use.

C. Prior to installation, posts shall be dried at least thirty (30) days after treatment and. All fabrication shall be performed prior to treatment. Where field cuts have to be made, the cut ends shall have two coats of concentrated preservative brushed on. Certificate of compliance from the treating plant shall be submitted to the Engineer.

PART 3 EXECUTION

3.01 INSTALLATION

A. All barrier rail shall be assembled and installed in accordance with the Standard Detail. Set all carpentry work accurately to required levels and lines, with all members plumb, true, and accurately cut and fitted. Securely attach carpentry work to substrates by anchoring and fastening as shown on drawings and as required by recognized standards. Do all cutting, fitting, and patching required to properly fit rough carpentry work. Make tight connections between members. Install fasteners without splitting wood. Deep tool marks in wood surfaces shall be considered evidence of poor workmanship and cause for rejection of the pieces affected.

B. All bolts shall be cut and peened to 1/4" after installation.

C. Contractor shall backfill surrounding area to provide positive drainage and in accordance with the drawings. All bolts shall be cut and peened as directed by the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 39 13
MANUFACTURED METAL BOLLARDS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this item, the Contractor shall furnish, erect, and powder coat Steel Bollard (Fixed or Removable) in accordance with the plans, specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.03 PAYMENT

A. The price bid shall be unit prices for EACH STEEL PIPE BOLLARD, furnished and erected, and shall include the cost for all labor, material, equipment, and incidental expenses necessary to complete the work, including average concrete, and powder coating, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A.	ASTM A-153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
B.	ASTM A-123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
C.	ASTM A53	Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated, Welded, and Seamless
D.	ASTM C-150	Portland Cement
E.	ASTM D3359	Rating Adhesion by Tape Test
F.	ASTM A780	Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Shop Drawings: The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures.

B. Design Mix Report: The Contractor shall submit a design mix report prior to the production and delivery of concrete for review and approval. Design Mix Report dated more than one year of the submittal date will be rejected. The Contractor shall submit the

design mix report including but not limited to the following information: date of design mix report, name and address of concrete mixing company, name and address of laboratory, name of project, water/cement ratio, type and sieve analysis of aggregates, type of cement, type and amount of fly ash or slag used, percentage of portland cement replacement by fly ash or slag, types of admixture used, amount of water used, air content, and slump of design mix, three day curing strength, seven day curing strength, and twenty-eight day curing strength.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Bollard shall be as manufactured by All City Play Equipment, Brooklyn, NY, Shannon Gates and Railings, Deer Park, NY, or approved equal.

B. Fittings and hardware shall be of the materials listed in the following schedule:

PART	MATERIAL
Post Caps	Malleable Iron – 3/16” Thick
Drive Pins and Set Screws	Stainless Steel, 18-8
Flange	Pressed Steel
U Bolts	Pressed Steel, Extra Heavy – 3/4" X 1/2"

C. Malleable iron casting shall be hot dipped galvanized in accordance with ASTM A-153 and powder coated per this specification.

D. Pressed steel fittings and appurtenances shall be powder coated and hot dipped galvanized in accordance with ASTM A-123.

E. Posts shall be extra strong galvanized steel pipe, 4” OD, and shall conform to ASTM A53, Type S, Grade B, Schedule 80, except that pipe shall be unthreaded and untested for water pressure.

F. Sleeves shall be standard weight galvanized steel pipe, 5” ID, and shall conform to ASTM A53, Type S, Grade B, Schedule 80, except that pipe shall be unthreaded and untested for water pressure.

G. One padlock shall be furnished for each removable bollard. The padlocks shall be Master Pro Series 6125LJ, as manufactured by Master Lock Company or approved equal. All padlocks for the same facility shall be keyed alike, with two and three-eighths inch width,

by three-quarter inch thick laminated steel body, maximum security, five pin tumblers with hardened boron alloy shackle no less than three-eighths inch diameter, two and one-half vertical clearance and 29/32" horizontal clearance. The Contractor shall furnish two keys for each padlock.

H. Concrete shall be placed as shown according to Contract Documents. Concrete shall conform to NYC DOT, class B-32, Type II A, air entrained, moderate sulphate resistant. The batch shall contain a minimum of six bags of cement per cubic yard of concrete, maximum of 6-1/4 gallons of water per bag, a minimum of three-inch slump, and minimum compressive strength of 3,200 psi. Large aggregate shall be limited to one inch.

I. Cement shall be air entraining Portland cement complying with ASTM C-150. It shall be Type IIA, Moderate Sulphate Resistant.

J. Fly Ash/GGBFS may be used to substitute for Portland cement up to a maximum of thirty percent. Fly ash shall conform to Class F, ASTM C618. GGBFS shall conform to Grade 100 or 120 slag as defined by ASTM C989. Substitutions that demonstrate the same or similar properties as Fly Ash/GGBFS shall be accepted pending review and approval by Engineer.

PART 3 EXECUTION

3.01 POWDER COATING

A. The galvanized steel pipe and fittings shall be powder coated with TGIC-Polyester.

B. Galvanizing shall provide an acceptable substrate for applied powder coatings. No lacquer, urethane or other coatings which would prevent proper adhesion of powder coating shall be applied to the pipe and fittings.

C. The powder coating shall be applied to the galvanized pipe and fittings in such a manner that the coating will not peel off. Ensure surfaces to be coated are clean and dry and free of grease, dust, rust, etc. All coated parts shall first receive phosphating and chromatizing treatments to improve the adhesion of the surface coating. Color to be black unless otherwise indicated on contract documents. The TGIC-Polyester shall be applied at a thickness of 3 to 4 mils. The TGIC-Polyester shall thoroughly adhere to the metal without peeling when scratched with a pick device or knife blade point.

D. At the discretion of the Engineer, a sample of the powder coated metal shall be laboratory tested for bonding of the powder coat. Test shall be the Cross Hatch test per ASTM D3359, method B. Failure to satisfactorily pass this test shall be a basis for rejection.

E. For minor damage caused by installation or transportation:

1. On damaged galvanized surfaces, apply organic zinc repair paint complying with ASTM A780. Galvanizing repair paint shall have 65 percent zinc by weight. Thickness of repair paint shall not be less than as required by ASTM A123.

2. On damaged powder coated surfaces, touch-up finish in conformance with manufacturer's recommendations. Provide touch-up such that repair is not visible from a distance of six feet.

3.02 ERECTION

A. The posts for fixed bollards shall be set in concrete footings as shown on the contract documents or as directed by the Engineer. Once erected, steel pipe of the fixed bollard shall be filled with average concrete. The sleeves for removable bollards shall be set in concrete footings, as shown on the contract documents or as directed by Engineer.

B. All posts and sleeves shall be set plumb and true to line and grade. Any post and sleeve not set true to line and grade shall be removed and replaced at the Contractor's expense. Bending posts to make them plumb will not be permitted.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 90 00
PLANTING

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide all labor, materials, equipment, insurance and incidentals required to furnish and plant the scheduled shrubs, trees and grasses, as shown on the Contract Drawings and in accordance with the specifications and the directions of the Engineer.

B. The Contractor shall furnish, plant, and maintain all bulbs specified in the plant schedule in accordance with the plans and specifications or as directed by the Engineer.

C. This Contractor shall plant the material specified in the following plant schedule in the planting beds in accordance with the plans and specifications, or as directed by the Engineer.

D. The Contractor shall furnish and place all mulch in accordance with the Contract Drawings, these specifications, and directions of the Engineer.

E. Planting must be performed by an approved Landscape subcontractor.

F. The Contractor shall be liable for any damages to property caused by his planting operations and all areas and construction disturbed shall be restored to their original condition to the satisfaction of the Engineer.

G. The Contractor shall install and maintain a waterfowl exclusion barrier as shown on the Contract Drawings that will discourage waterfowl from entering and grazing on newly planted plants.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 56 39 – Temporary Tree and Plant Protection

C. Section 32 90 05 – Soil Mixes

D. Section 32 92 19 – Seeding

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and will be compensated in full for furnishing and placing all materials, labor, equipment, tools and incidentals necessary to complete the work in accordance with these specifications, including: preparation, mycorrhizal inoculant, fertilizer, mulch, excavation, and maintenance, all in accordance with the plans and specifications, to the satisfaction of

the Engineer.

B. The price bid for TRANSPLANTING TREES shall be unit price per EACH.

C. The price bid for PLANTING SHRUBS shall be unit price per EACH.

D. The price bid for PLANTING TREES shall be unit price per EACH tree ranging 3”-3.5” caliper.

E. The price bid for PLANTING PERENNIALS shall be unit price per EACH.

F. The price bid for PLANTING HERBACEOUS/ACCENTS shall be unit price per EACH.

G. The price bid for INSTALLING GROUNDCOVER shall be unit price per EACH.

H. The price bid for PLANTING GRASS shall be unit price per EACH 2” plug.

I. The price bid for WATERFOWL EXCLUSION BARRIER shall be unit price per SQUARE YARD and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the work, including posts, monofilament fence line, stakes, reflective bird scare flash tape, exclusion fencing and maintenance, all in accordance with the plans and specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. International Society of Arboriculture Appraisal Method

B. American Joint Committee on Horticultural Nomenclature 1942 Edition

C. USDA Agricultural Research Service, Plant Hardiness Zone Map

D. American Association of Nurserymen, Inc. (American National Standards Institute) Nursery Stock (ANSIZ6O. 1-latest edition)

E. Manual of Vascular Plants of the Northeast United States and Canada, Gleason and Cronquist, 1991

F. A Checklist of New York State Plants, Contributions to a Flora of New York State, Checklist III, Bull. # 458, Richard S. Mitchell, State Botanist, New York State Museum, 1986.

G. New York City Department of Transportation ("NYCDOT") Standard Highway Specifications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Before digging the pits, the Contractor shall submit, for approval, his method of soil preparation and planting to perform the Work shown on the Contract Documents. Soil amendments shall be thoroughly mixed by approved methods. The soil around each plant must be thoroughly saturated with water upon planting.

B. List of Materials/Suppliers: Submit a complete materials list (e.g., trees, mulch, fertilizer, mycorrhizal inoculant, cedar stakes, shrubs, etc.) of items to be provided under this section, for review by the Engineer or representative before the purchase or use of any such material.

C. Method of Work: Submit a list of proposed methods of execution of Work under this section for review by the Engineer when proposed methods are different from, or supplementary to, those specified herein.

D. The Contractor must submit the following information to the Engineer immediately following the Notice to Proceed:

1. Subcontractor(s): The name of a Landscaping Contractor, acceptable to the Engineer, who will be performing all landscaping Work (seeding and woody plant material). The proposed subcontractor will be evaluated on the following criteria and that stated in Section 01 56 39 – Temporary Tree and Plant Protection.

   a. Prior satisfactory experience in the installation of Green Infrastructure Systems.

   b. Demonstrated capacity to accomplish the Work in the time allotted. Qualifications of the Contractor's arborist, certified by the International Society of Arboriculture (ISA), who shall be required to be present on Site while landscaping Work is in progress.

   c. Landscaping experience with other agencies, such as the Department of Environmental Protection (DEP) and the New York City Department of Parks and Recreation. Provide references and a specific contact person.

   d. Membership with appropriate ecological restoration organizations.

   e. Other references or experience deemed appropriate to obtaining approval.

   f. The following is required prior to the start of landscaping Work:

      i. List of all materials and certificates specified within this item.

      ii. Schedule/Methods of Operation/Maintenance Plan (which is up to the end of maintenance period as mentioned in the Schedule "A" of this project).

      iii. List of all equipment to be used.

2. Arborist Subcontractor Qualifications: Listed in Section 01 56 39 – Temporary Tree and Plant Protection.

3. The Contractor shall furnish two (2) labeled samples of the Mulch intended for use in the Work for approval and the Engineer's use. The label must include the manufacturer's product name and the type of material. The Engineer reserves the right to reject on or after delivery any materials which do not, in his opinion, meet these specifications.

E. Contractor shall submit catalogue cut sheets for the waterfowl exclusion posts, monofilament fence line, stakes, and reflective bird scare flash tape to be used.

1.07 QUALITY CONTROL

A. Sources

1. Primary Source. All trees must be obtained from commercial nurseries and from within 150 miles of the planting site. A reasonable effort shall be made to obtain sources of plants as close to the planting Site as possible. Any plants grown and/or originating from outside the 150-mile radius may be rejected. In addition, all plants must have been grown within the 6a to 7a planting zones, inclusive, USDA Plant Hardiness Zones as that of the planting Site. No substitutions of specified plants will be accepted without the written permission of Engineer.

2. Ship landscape materials with certificates of inspection when required by governmental authorities. Comply with governing regulations applicable to landscape materials.

a. Nurseries that collect plants from the wild will be rejected.

b. If specified landscape material is not obtainable, submit proof of non-availability, with written proposal for use of equivalent material to Engineer.

c. The Contractor shall provide trees of quantity, size, genus, species shown and scheduled for landscape Work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock" as referenced above (e.g., container size, plant height, number of stems, etc.). The Contractor shall provide healthy, vigorous stock, grown by a professional nursery in accordance with good horticultural practices and free of diseases, insects, eggs, larvae and defects including, but not limited to, knots, sun-scald, injuries, abrasions, or disfigurement.

d. All plants furnished under this Item must be true to name. Plant names must agree with the nomenclature of "Manual of Vascular Plants of the Northeast United States and Canada," Gleason and Cronquist, 1991. Size and grading must conform to those of the American Association of Nurserymen.

B. Inspection of Plant Material at Nursery

1. The Engineer or his representative shall inspect all plant material used on this project at the place of growth before planting, for compliance with requirements for genus, species, variety, size and quality. The Contractor shall be responsible for all inspection costs beyond a 50-mile radius from the planting Site.

2. The Engineer or his representative retains the right to further inspect all plant material for size and condition of root system, insects, injuries and latent defects, and to reject unsatisfactory or defective material anytime during the progress of Work. The Contractor shall remove rejected plant material from the project Site immediately upon notification without compensation.

3. Only tagged samples of plant material will be delivered to the Site and planted in locations approved by the Engineer or representative.

4. The Contractor shall be responsible for all certificates of inspection of plant materials that may be required by Federal, State or other authorities to accompany each shipment of plants and on arrival, the certificates must be filed with the Engineer.

1.08 DELIVERY, STORAGE AND HANDLING

A. Plants

1. Plants must be packed, transported, and handled with utmost care to insure adequate protection against injury. Plant material must be delivered to the Site in such a manner as to not damage the bark, break branches, or destroy the natural shape of the plant.

2. When transported in closed vehicles, plants must receive adequate ventilation to prevent sweating. When transported in open vehicles, plants must be protected by tarpaulins or other suitable cover material.

3. Each shipment of plants must be declared and certified free of diseases of any kind with such necessary inspection certificates accompanying each shipment.

4. To protect plant material from desiccation, the Contractor shall, when deemed appropriate and only on appropriate plant material, apply an approved anti-desiccant forty-eight (48) hours prior to transporting and fully cover plant material during transportation to the planting Site.

5. Plant material must not be dropped or in any way be mishandled during unloading. Plants damaged during transportation to the Site will be immediately rejected. Unacceptable conditions include, but are not limited to, the following: loose burlap or rope, soil spilling from ball and burlap (B&B) or containers, plants that move independently of root ball or container, soil missing from B&B or containers, and irregularly shaped root balls.

1.09 ORDERING PLANT MATERIALS

A. The Contractor shall notify the Engineer of the unavailability of any tree, shrub, herbaceous plant, or bulb species designated in the Contract, as well as provide confirmation to the Engineer of all orders from all sources of supply. Any request for species substitution due to unavailability must be submitted in writing to the Engineer, within fifteen (15) days of the award of Contract. The Contractor must include the names and addresses of at least ten (10) nurseries they have contacted in an effort to locate these species, and the list will be submitted to the Engineer. All nurseries supplying material are required to have a registration certificate from the Department of Agriculture and Markets, Division of Plant Industry, New York, or any other state where plant material is obtained, certifying that plant material is apparently free of injurious insects and diseases.

1.10 ASIAN LONGHORNED BEETLE QUARANTINE ZONE REGULATIONS

A. Due to current Federal, State and NYC DPR policy, the following host species may not be planted in the quarantine zone. Host species are as follows: Acer-Maple, Aesculus-Horsechestnut/Buckeye, Salix-Willow, Betula-Birch, Populus-Poplar, Ulmus-Elm, Albiza-Mimosa/Silk Tree, Celtis-Hackberry, Fraxinus-Ash, Platanus-London Planetree, Sycamore, Sorbus-Mountain Ash.

B. In addition, Nurseries located within the quarantine zone must comply with State and Federal Law and all Contractors and/or Subcontractors shall be certified by the New York State Department of Agriculture and Markets to perform Work within the Quarantine Zone. For additional information, including the extent of the quarantine zone, see the NYCDOT, Standard Highway Specifications, General Conditions, Subsection 1.06.23.(R), "PLANT PEST CONTROL REQUIREMENTS."

1.11 EMERALD ASH BORER

A. The following host species may not be planted, unless specifically directed by NYC Parks, Fraxinus – Ash.

PART 2 PRODUCTS

2.01 WOODY AND HERBACEOUS PLANT MATERIAL

A. Plant names, size, and grading standards for woody and herbaceous plant material must conform to those prepared by the American Association of Nurserymen Horticultural Standards, 1998 Edition, unless otherwise specified. No substitutions are permitted, except with the written permission of the Engineer in consultation with the City of New York Parks and Recreation's Green Infrastructure Liaison.

B. All plants must be typical of their species or variety. The plants must have normal, well developed branches and vigorous fibrous root systems. The plants must be sound, healthy, vigorous plants free from defects, disfiguring knots, sun scald injuries, dead or broken branches, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation and weeds. All plant material must be tagged by the Engineer before the purchase or use of any such material.

C. All plants must be nursery-grown, unless otherwise stated. All trees and shrubs must have been growing under similar climatic conditions as the locations of this project for at least two (2) years prior to the date of the Contract. Plants held in storage will be rejected if they show signs of growth during storage. Collected plants must be taken from a subgrade favorable to good root development. All collected material must be clean sound stock, free from decaying stumps.

D. Herbaceous plants, vines, and groundcover must be vigorous healthy plants, a minimum two (2) years old, from cuttings, seed, or division, with well-developed root systems and crowns, as specified in the Plant Schedule. Bulbs, corms, tubers and rhizomes shall be firm, non-desiccated, and certified free of disease and viral infection, of the sizes, grades, and varieties indicated in the Plant Schedule.

E. Plant material must be as shown on the Tree Planting Schedule as shown on the Contract Drawings. Where applicable, the Contractor shall provide freshly dug plant material. Cold storage or previously dug plants will not be acceptable. The Contractor shall not prune prior to delivery unless otherwise directed and approved by the Engineer or representative. Plants that are pruned without authorization from the Engineer will be rejected.

F. Burlap: Burlap must be a natural fabric, nylon burlap is not permitted.

G. Cord or Rope: Cord or rope must be sisal twine, nylon rope is not permitted.

H. Mycorrhizal Fungi Inoculant

Shall be applied by means of a three ounce (3 oz.) premeasured dry formulation packet, such as Mycor Tree Saver Transplant®, as manufactured by Plant Health Care, Inc., Pittsburgh, PA. Rhizanova Tree Transplant, as manufactured by Becker Underwood, Inc., Ames, IA, or approved equal. 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 (Pisolithus tinctorius); Biostimulant ingrediants including Yucca schidigera extract; soluble sea kelp extract derived from Ascophylum nodosum; humic acids; and acrylamide copolymer gel as a water absorbent medium.

I. Water Retention Additive

1. Water Retention Additives shall be a granular polyacrylamide polymer of a potassium base and not a sodium base that slowly releases moisture into the root zone such as Terra Sorb, as manufactured by Plant Health Care, Inc., Pittsburgh, Pa., or approved equal. It shall be applied at the time of planting during a dry planting as defined by Parks and Recreation. When planting trees, each tree shall receive three (3) ounces or amount specified by product instructions. Half should be added at a depth of 8-10 inches and the other half just below the finished surface. When planting shrubs, perennials or annuals, the product should be applied as per product instructions.

J. Organic Biofertilizer

1. Natural Organic Fertilizer shall be Plant Health Care's "Healthy Start ™" (3-4-3) Fertilizer, or approved equal, and have the following composition.

a. Nutrient Analysis

Total Nitrogen (N)	3%
Water Insoluble Nitrogen	2.5%
Ammoniacal Nitrogen	0.5%
Available Phosphate (P_2O_5)	4%
Soluble Potash (K_2O)	3%
Calcium (Ca)	4%
Iron (Fe)	1%

b. Humic Acids 3%
Rhizosphere Bacteria 400,000 cfu/g

2.02 COMPOST

A. Compost: contains organic matter, or material of generally humus nature capable of sustaining the growth of vegetation, with no admixture of refuse or material toxic to plant growth. The Compost is free of pathogens and stones, lumps, or similar objects larger than two inches (2") in greatest diameter, as well as roots, brush, and weeds.

B. Compost can be obtained from Long Island Compost, Islip, NY or "Nature's Choice Compost" by Nature's Choice Corp., Union, NJ, or Agresoil compost by Agresource, Inc.

Amesbury, MA or approved equal. Organic biosolids are not acceptable. Compost available from NYC Department of Sanitation may be acceptable for purposes of this specification. See www.nyc.gov/sanitation or www.nyccompost.org for pick-up sites.

2.03 STAKES

A. All staking shall be done immediately after planting and all stakes and ties shall be maintained. Plants shall stand plumb after staking. Stakes shall be of white cedar with bark attached. They may have a maximum allowable deflection of ten (10%) percent. Stakes of the dimensions shown on the contract documents shall be placed outside the root ball and shall be driven to the depths indication on the contract documents.

Camb Guard ® Specifications

Tree Diameter	Model Number
2" or less	92-113
2" or larger	92-112 or 92-111

B. Where deemed necessary by the Engineer, stakes for supporting trees shall be White or Red cedar, with a minimum diameter of three inches. Contractor shall use Camb Guards belts model # 92-111, 92-112, or 92-113 by Keslick and Son Modern Arboriculture, 214 N Penn Street, West Chester PA, 19380 (610)-696-5353 or approved equal. Camb Guards around tree trunk and stake shall be fastened in such a manner as to allow slight movement of trunk. Ties shall be attached to the stake no more than four (4”) inches below the top of the stake.

C. Stakes shall be set parallel to the contours, curbs or walks, unless otherwise directed by the Engineer. Trees shall stand plumb after staking. Stakes and ties shall be removed at the end of the guarantee period, unless otherwise directed by the Engineer and shall become the property of the Contractor. At the time the stakes are removed any holes left by the stake shall be filled with planting pits and beds soil.

2.04 PLANT DIMENSIONS

A. A plant must be dimensioned as it stands in its natural position. Trees up to and including four (4) inch caliper size shall be measured six (6) inches above ground level. Trees over four (4) inches in caliper size must be measured twelve (12) inches above ground level. Stock furnished must be a fair average of the minimum and maximum sizes specified. Larger plants cut back to sizes specified will not be accepted.

B. Container grown herbaceous plants, groundcover, and vines must be well rooted in the container size indicated on the Plant Schedule, grown in the container at least one (1) year prior to planting. Bulbs, corms, tubers and rhizomes shall be Top Size, or as indicated on the Plant Schedule. Annual flowering plants must be vigorous, well rooted, with no indications of disease or stress.

2.05 PREPARATION OF PLANTS

A. All precautions customary in good trade practice shall be taken in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. All plants must be dug immediately before moving unless otherwise specified. All plants must be dug to retain as many fibrous roots as possible. Balled and burlapped and balled and platformed plants must have a solid ball of earth of minimum specified size, securely held in place by burlap and stout rope or twine. Oversized or exceptionally heavy plants are acceptable if the size of the ball or spread of roots is proportionately increased, to the satisfaction of the Engineer. Loose, broken, or manufactured balls will be rejected. Bare root plants must be puddled immediately after digging by immersing the roots in a hydrogel slurry, so as to completely coat the roots.

2.06 PLANT SCHEDULE

A. Abbreviations

1.	Item No.	–	Indicates specific species of plant material, including a description
2.	Cal.	–	Indicates the caliper of the trunk of the tree
3.	B & B	–	Indicates tree or shrub to be balled and burlapped
4.	B.R.	–	Indicates a tree or shrub to be delivered "bare root"
5.	O.C.	–	Indicates "on center" or spacing between plants in all directions
6.	Ht.	–	Indicates overall height of tree

B. Item No.: Genus species and plant description

1. TREES: All trees must be branched 6’ to 7’ from the ground; trees must not have any limb cuts over 3/4" which have not completely calloused over. Sizes must be as indicated.

2. All B&B trees must be dug with firm root balls free of noxious weeds. There should be no excess soil on top of the root ball or around the trunk. Loose, broken, or manufactured balls will be rejected. Well-branched top and fibrous root system essential.

C. Items are listed by estimated size and/or shared similarities; they include—but are not limited to—the genus and species listed beneath each item.

D. No material will be planted by the Contractor until inspected by the Engineer at the Site of the Work. All rejected material must be immediately removed from the Site, and replaced with acceptable material at no additional cost to DEP. Final inspection will be made upon completion of the Contract.

2.07 SHREADDED HARDWOOD MULCH

A. Shredded hardwood mulch must consist of natural wood and bark from hardwood trees that have been milled to a maximum 3" in length and 1" in width.

B. Shredded hardwood mulch must be double shredded.

C. Shredded Hardwood Mulch must contain no more than twenty (20%) percent hardwood sawdust and negligible amounts of other foreign materials.

D. Mulch must be of blended hardwood with no additives or any other treatment.

E. Mulch must be shredded and aged a minimum of six (6) months.

F. The pH factor shall range from 5.8 to 6.2.

2.08 WATERFOWL EXCLUSION FENCE

A. Stakes shall be 2" x 2" x 8' stakes of pointed tipped, untreated FSC- Certified hardwood timber, or equal.

B. 80 LB. Monofilament fence line shall be white or other acceptable color.
Fence line shall not be clear.

C. Goose Fencing shall have grid size of 0.75" to 1", or approved equal.

D. Contractor shall use two half hitches to fasten reflective bird scare flash tape.

PART 3 EXECUTION

3.01 PLANT INSTALLATION

A. Unless otherwise directed by the Engineer, plant material may be transplanted from March 1st to May 1st and from October 15th to December 15th or as weather permits; deciduous material shall be planted from March 1st to May 1st and October 15th to December 15th or as weather permits. Evergreen material shall be planted from April 1st to May 15th and from September 1st to October 15th or as weather permits. No plant material will be planted when the ground is frozen or in excessively moist condition. Notify the Engineer and NYC Department of Parks and Recreation Green Infrastructure Liaison at least three days business days in advance before proceeding with any planting operations. In the event that the planting season is missed for any reason, the Contractor shall cover the soil with mulch. Mulch must comply with the requirements of this specification..

1. No shipment of plant materials will be unloaded or planted by the Contractor until such materials have been inspected and accepted by the Engineer, and inspection certificates, if any, have been delivered. Plant material will be rejected if delivered with broken or damaged root balls, or if damaged on Site by rough handling. All rejected material must be removed from the Site and replaced with acceptable

material at no additional cost to DEP. Final inspection will be made upon Substantial Completion of the Contract.

2. No planting shall be done except in the presence of the Engineer or the Engineer's representative, and in accordance with the planting schedule.

3. The Contractor shall proceed with and complete Work expeditiously, working within the seasonal limitations for each kind of landscape Work required.

4. Determine location of underground utilities and perform Work in a way that will avoid possible damage. Hand excavate as required. The Contractor assumes responsibility for damage to underground utilities when excavating and is required to call "One Call" @ 800-272-4480, a service that marks underground facilities on the surface, prior to excavation. Maintain grade stakes set by others until removal is approved by Engineer. However, the Contractor is advised that the provisions of 16 NYCRR Part 753 ("One Call") do not apply to City-owned utilities. The Contractor is responsible to determine the location of the City-owned underground distribution systems. The Contractor shall make his own field observations and research the City's records to determine the location of such facilities before the commencement of excavation.

5. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions or obstructions, notify Engineer before planting.

6. The Contractor shall furnish a certification from the nursery regarding the date of digging. All appropriate plant material must be sprayed in the nursery within forty-eight (48) hours prior to digging with an approved anti-desiccant.

B. For each plant, dig a hole to correct depth for the placement of the plant material. Place balled and burlapped material in the prepared planting pit by lifting, and carry it by the rootball. Set the tree or shrub straight and in the center of the pit, with the most desirable side facing toward the predominant view. All material must be set after settlement, at the same level at which they have grown in the nursery. Care must be exercised in setting the plants plumb. All ropes, stones, etc. must be removed from the pit before backfilling. Soil for backfilling must be loose and friable and not frozen or solid.

C. Cut and remove rope from the top fifty (50) percent of the rootball and pull the burlap back to the edge of the ball. Remove as much woven product and twine as possible. All plastic or synthetic fabric must be removed from the ball at the time of planting.

D. Balled and burlapped plants must be handled so that the ball will not be loosened. After the soil has been thoroughly firmed under and around the ball, the burlap must be cut away from the upper half of the ball, and the remaining burlap adjusted to prevent the formation of air pockets. Where directed by the Engineer, the burlap must be entirely removed. Soil must be firmed at six (6) to eight (8) inch intervals and thoroughly settled with water. Plants with exposed roots must be placed in the proper position in the center of the pit after the soil in the bottom of the pit has been firmed. Roots must be arranged in their natural position and existing soil worked in among them, firmed at intervals and thoroughly settled

with water. Care must be taken to avoid bruising or breaking the roots when tamping the soil. All large and fleshy roots which are bruised or broken must be pruned, making a clean cut before planting.

E. Container plants must be carefully removed from the containers or flats immediately prior to planting and set to the same depths as they were grown in the nursery bed or container, to the correct spacing indicated on the plans. Roots must be arranged in their natural position and Rain Garden Soil worked in among them, taking care to avoid bruising or damaging the roots. Fertilizer tablets added to the top four (4") inches of backfill soil in the correct proportion for the respective pot size. No later than one (1) hour after planting, all plants must be thoroughly settled with water.

F. Mycorrhizal Fungi Inoculant must be applied as per the manufacturer's recommended rate. Mycorrhizal fungi inoculant must be added to the top six to eight inches (6-8") of backfill soil in each planting pit and thoroughly mixed to distribute the inoculant. The material must be applied according to the following table:

Size of rootball or container	Ounces per plant
1 gallon	1
2 gal.	2
3 gal.	3
5 gal.	3
7 gal.	3
10 gal.	3
15 gal.	3
20" B&B	6
24" B&B	9
30" B&B	9
36" B&B	12
12" B&B	12

1. The Contractor shall furnish a certified report from an approved testing laboratory, showing a full analysis of a representative sample of the Mycorrhizal Inoculation that is proposed to be used. Application equipment, method of operation and schedule must also be submitted prior to use.

2. Mycorrhizal inoculation shall be carried out before or during planting and incorporated thoroughly into the top 4" of the planting pits and beds soil/rain garden soil.

3. Mycorrhizal inoculation shall be limited to conditions in which the temperature of the inoculum may be kept below 90° F and above 32° F at all times.

4. Mycorrhizal inoculum shall be stored and transported out of direct sunlight and in all cases prevented from rising above 90° F.

5. The Planting Pits and Beds Soil/Rain Garden Soil shall not be compacted or made smooth and level after the inoculation. All operations are to be performed in the presence of, and as directed and approved by, the Engineer or his representative.

All empty containers of the fungi shall be turned in at the end of each day for verification of use.

G. Organic Biofertilizer must be applied as per the manufacturer's recommended rate. Application of the Biofertilizer jointly with the Seeding or Mycorrhizal application or with both is acceptable. The Contractor is responsible to coordinate effective tillage depths and application sequence. The material must be applied according to the following table:

1. Application Rate – Trees and Shrubs

PLANT SIZE	APPLICATION RATES
1 gallon plant =	1 cup (1/4 lb.)
5 gallon plant =	2 cups (1/2 lb.)
15 gallon plant =	4 cups (1 lb.)
24" root ball =	6 cups (1 1/2 lb.)
36" root ball =	10 cups (2 1/2 lb.)
42" root ball =	12 cups (3 lbs.)
54" root ball =	16 cups (4 lbs.)
72" root ball =	20 cups (5 lbs.)

Proportionate amounts of fertilizer shall be added to between sizes.

2. Biofertilizer shall be uniformly spread around the base of each plant and thoroughly incorporated in the top 10 (ten) inches of the backfill of the planting hole.

3. Biofertilizer application rates may be increased should the soil test results indicate a deficiency in any specific nutrient(s).

4. Biofertilizer shall arrive at project site in original unopened bags. Each fully labeled, conforming to the name or trademark and warranty of the producer.

5. Biofertilizer shall be packed in the manufacturer's standard containers weighing not more than 100 pounds each. The name of the material, net weight of contents and the manufacturer's name and guaranteed analysis shall appear on each container. The ENGINEER reserves the right to reject any material that has become caked or otherwise damaged. If the material is not used immediately after delivery, it shall be stored in a dry place in such manner that its effectiveness will not be impaired.

H. The Contractor shall cultivate and rake over finished planting areas and shall leave the Site in an orderly condition. On level ground or slight slopes, a shallow basin a little larger than the diameter of the plant pit must be left around each plant, as shown on the plans, or as directed by the Engineer. On steep slopes, the soil on the lower side of the plant must be graded in such a manner that it will catch and hold water, as shown on the plans, or as directed by the Engineer.

1. Upon completion of planting, all debris and waste material resulting from the planting operation must be removed from the project area, and the affected area raked and cleaned as necessary.

I. All Work done in preparing shallow basins or grading of plant pits on steep slopes and regrading and reseeding of plant saucers must be deemed included in the unit price per plant.

J. Only crossing, broken or badly bruised branches must be removed. These branches must be pruned with a clean cut. All pruning must be done with sharp pruning tools in accordance with instructions of the Project Manager and the attached pruning diagram. At the time of planting, pruning cuts must be made at the base of the branch at such a point and angle that neither the branch collar nor the bark of the stem is damaged, and that no branch stub extends from the collar. Crowns of young trees must not be cut back to compensate for root loss. Leaders are not to be cut.

K. The Contractor shall establish a neat edge where planting areas meet grass areas, as shown on the plan or as directed by the Engineer. Edging must be done by competent mechanics in a workmanlike manner with a spade or edging tool immediately after all planting is completed.

1. The Contractor shall exercise particular care in edging to establish good flowing curves as shown on the plan or as directed by the Engineer. Edging must be maintained by the Contractor until final acceptance of the Contract.

L. All staking must be done during planting operation and must be maintained throughout the first year of the guarantee period.

1. Unless otherwise directed, trees must be staked as shown on the plans and in accordance with the requirements of this specification.

2. Trees must stand plumb after staking. Stakes, guys and straps must be removed at the end of the first year of the two year guarantee period, unless directed otherwise by the Project Manager. At the time the stakes are removed any holes left by the stake must be filled with Rain Garden Soil.

M. At the time of planting, the entire planting bed must be saturated to a depth of one (1) foot with twenty (20) gallons being distributed to each tree. Water must be free from oil, have a pH not less than 6.0 or greater than 8.0 and must be free from impurities injurious to vegetation. Unless otherwise directed, water may be drawn from mains owned by or supplying water to the City of New York.

1. Watering shall take place at one-week intervals from May 1 through October 31, for a total of twenty-seven (27) waterings per year or a total of fifty-four (54) scheduled waterings for the 2-year maintenance period. Each week, the individual plants shall receive the following volume of water:

PLANT SIZE VOLUME OF WATER

# 1 container	2 gallons
# 2 container	2.5 gallons
# 3 container	3 gallons
# 7 container	6 gallons
1" – 2" caliper	18 gallons
2" – 3" caliper	30 gallons

2. The Engineer may order more or less watering based on weather and soil conditions.

3. Watering shall not be done for any given week if soil is saturated from recent rains or snowmelt. During extended dry periods, the Engineer may order more frequent watering than scheduled or during non-scheduled periods.

4. Watering shall be applied in such a manner as to not damage plants or remove wood chip mulch and stakes. Watering shall not cause the uprooting or the exposure of plant roots.

5. Damage resulting from improper watering shall be immediately repaired at the Contractor's expense.

6. The watering method to be used shall be approved by the Engineer.

3.02 CONSTRUCTION METHODS

A. Plants will be delivered only when preparations for planting have been completed and plants can immediately be installed. If planting is delayed for more than six (6) hours after delivery, set plant material in shade, protect from mechanical damage and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture, watering as necessary.

B. The time of planting is subject to the type and size of the material, method of planting and approved planting schedule. The Contractor shall furnish a certification from the nursery regarding the date of digging for all applicable plant material.

C. Sizes of planting pits will conform to the Contractors approved Shop Drawing submittals.

D. While trees with exposed roots are being distributed in planting beds or are awaiting planting after distribution, the Contractor shall protect the roots from drying out; the means employed shall be satisfactory to the Engineer. All trees must stand, after settlement, at the same level at which they have grown. Care must be exercised in setting the plants plumb. All ropes, stones, etc., must be removed from the pit before backfilling. Soil for backfilling must be loose and friable.

E. All plant material must be thoroughly watered immediately after installation. Planting will not be permitted unless a water truck is on Site and made available whenever the Contractor is installing plant material.

F. Anti-desiccant spraying - Unless otherwise directed all trees will be sprayed with an approved anti-desiccant (Wilt Pruf NFC or approved equivalent) using a power sprayer to apply adequate coverage, according to manufacturer's directions, over trunks, branches, twigs and foliage as directed by and in the presence of the Engineer. The Contractor must read the product label carefully as some plant material can be injured from the application of an anti-desiccant. The material to be used shall be emulsions or other materials that will provide a protective film over plant surfaces, yet permeable enough to permit transpiration. The time of spraying shall be as follows, unless otherwise directed by the Engineer:

1. Deciduous: Spring planting - Apply when leaves have reached seventy-five percent (75%) of mature size.

3.03 LANDSCAPE GUARANTEE AND REPLACEMENT

A. Watering must take place throughout the guarantee period, at approximately two (2) week intervals from May 1 to October 31. Not less than once a week if it has not rained during that period. The Engineer may order less watering based on weather conditions, resulting soil water content or other factors. If drought conditions warrant, the Engineer may order more frequent watering than scheduled or during non-scheduled periods. A watering schedule must be submitted to the Engineer each week.

1. During dry conditions as defined by the Engineer, the Contractor will add to water a wetting agent product that is meant to aerate soil and allow for more water to penetrate. An anti-desiccant to help prevent loss of water through transpiration must also be used when directed by the Engineer. The anti-desiccant product, approved by the Engineer, must be mixed into water at appropriate ratios (Contractor must follow product instructions).

B. Contractor shall request, in writing, an inspection of all landscaping Work upon completion so as to trigger the maintenance and guarantee period (refer to Schedule A).

1. Maintenance includes weeding, cultivating, edging, control of insects, fungus and other diseases by means of spraying with an approved insecticide or fungicide, pruning, adjustment and repair of stakes, and woven polypropylene material, repair of minor washouts, soil replacement, mulching and other horticultural operations necessary for the proper growth of all trees, and for keeping the entire area within the Contract limits neat in appearance.

C. Plant material found to be unsatisfactory or in poor condition at the inspection will be removed and replaced at the appropriate planting season for that type of plant material. No payment will be made for plant material found to be unacceptable during this inspection.

D. Unless a written waiver of this clause is issued, under the terms of the guarantee, replacement plants will be chosen only by the Engineer.

E. The Contractor shall submit, in writing, any conditions or species which he feels may be questionable prior to ordering said plants. If agreeable, the Engineer will substitute recommended species or address the conditions deemed unsuitable. However, upon

ordering a plant and installing it, and upon Engineer's approval of the installation, the Contractor accepts the responsibility for guaranteeing the plant's survival without exception.

F. The Contractor shall replace, in accordance with the Contract plans and specifications, any planted tree, shrub, perennial or grass that is dead or, in the opinion of the Engineer, is in an unhealthy or unsightly condition, and/or has lost its natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, or other causes including vandalism, prior to final acceptance, in the next planting season within the maintenance and guarantee period. The guarantee on replaced shrubs, groundcover plants, perennials and grasses will remain in effect for duration as originally referenced in Schedule A. When instructed by the Engineer, the Contractor shall replace trees, shrubs, perennials or grasses that have died after final acceptance in the next appropriate planting season, provided that the season falls within the maintenance and guarantee period. Trees, shrubs, perennials or grasses that die within the maintenance and guarantee period must be replaced as many times as necessary within the maintenance and guarantee period to ensure the presence of a live tree, shrub, perennial or grass at each location at the end of the guarantee period. The costs of replacement(s) shall be borne solely by the Contractor.

1. Where vandalism or other third-party actions are deemed by the Engineer to necessitate the replacement of a specific tree, shrub, perennial or grasses replacement, the Contractor shall be responsible for replacement only once of that specific vegetation type during the maintenance and guarantee period. Where dead shrubs, groundcover plants, perennials or grasses have been identified, whether due to natural causes or vandalism, the Contractor shall remove the dead material, including stakes, **within three (3) weeks of notification**. The Contractor shall add Rain Garden Soil, grass seed or appropriate paving material at the direction of the Engineer to the pit to eliminate potential tripping hazards at the time of removal.

G. All planting areas must be cultivated and weeded with hoes or other approved tools within the period from May 1st to October 31st. Such cultivating and weeding must be repeated at least every three (3) weeks. Prior to the installation of plant material, the Contractor must submit a weeding schedule and plan to be approved by the Engineer. The plan must include proposed methods of cultivating and weeding indicating all proposed weeding tools. Weed whackers may not be used. Weeds must be removed with the roots.

1. No separate payment will be made for watering, weeding or any other maintenance outlined in this section throughout the duration of the maintenance period and such Work will be deemed included in the bid for Plant Material.

3.04 GRASS RESTORATION

A. All grass in the Right-of-Way that is impacted by Contractor's Work shall be restored to existing conditions in accordance with the New York City Department of Transportation (NYCDOT) Standard Highway Specifications Section 4.20 – Seeding unless directed to restore to concrete sidewalk on the Contract Drawings or by the Engineer. No additional payment shall be made for this Work. All other seeding shall follow Section 32 92 19 – Seeding.

3.05 MULCH

A. CONSTRUCTION METHODS

1. Mulch must be applied as a ground cover to the surface of all On-Site Green Infrastructure Practices after the planting is completed. Mulch must be applied to a uniform depth of three (3) to four (4) inches for a tree pit/shrub, perennial and groundcover beds and must be distributed as to create a smooth, level cover. Mulch must not be placed within two (2) inches of tree and shrub stems. Plants must not be covered.

B. MAINTENANCE

1. Maintenance shall include watering, weeding, cultivating, edging, control of insects, fungal infections, and other diseases by means of spraying with an approved insecticide or fungicide, pruning, adjustment and repair of stakes, anchors, and wires, repair of minor washouts and gullies up to twelve inches (12") in depth, and other horticultural operations necessary for the proper growth of all trees, as well as replacement of plants stolen or vandalized prior to Substantial Completion Inspection, to a degree judged sufficient for replacement by the Engineer. The Contractor shall also be responsible for keeping the entire area within the contract limits neat in appearance until the final acceptance and completion of the whole work of this contract. All planting areas shall be watered, cultivated, and weeded with hoes or other approved tools within the growing season extending from May 1st to October 1st, and such cultivating and weeding shall be repeated at least once a week. Under no condition shall weeds be allowed to attain more than six inches (6") of growth. The cost of such maintenance shall be included in the bid price.

3.06 WATERFOWL EXCLUSION BARRIER

A. Install waterfowl exclusion barrier materials immediately following installation of wetland plant materials in the locations shown on the Contract Drawings.

B. The perimeter waterfowl fence shall be at least 1.5 feet outward from the plants at the perimeter of each wetland planting area. Interior waterfowl fences shall be installed to form a 10 ft by 10 ft grid covering the entire wetland planting area.

C. Replace plant materials damaged following planting due to absence of herbivory controls immediately at Contractor’s expense.

D. At the end of the warranty period, leave the waterfowl exclusion barrier in-place.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 90 05
SOIL MIXES

PART 1 GENERAL

1.1 REQUIREMENTS

A. This section describes Rain Garden Soil, Planting Pits and Beds Soil, and Sand. The Contractor shall furnish, amend (if required, pH amendments are not permitted), place and prepare the Rain Garden Soil or Planting Pits and Beds Soil for seeding and/or plant material as shown on the Contract Drawings and/or as directed by the Engineer.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 31 23 16 – Excavation

C. Section 32 90 00 – Planting

D. Section 32 92 19 – Seeding

1.3 PAYMENT

A. The price bid for RAIN GARDEN SOIL shall be unit price per CUBIC YARD.

B. The price bid for PLANTING PITS AND BEDS SOIL shall be unit price per CUBIC YARD.

C. The price bid for MULCH IN NON-PLANTED AREAS shall be unit price per CUBIC Yard.

D. The price bid for SAND shall be unit price per CUBIC YARD.

1.4 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. AASHTO T 27 Sieve Analysis of Fine and Coarse Aggregates

B. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

C. Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, Revised July 2011 or latest.

D. USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42 Version 5.0, 2014.

1.5 REGULATORY COMPLIANCE (NOT USED)

1.6 SUBMITTALS

A. Prior to the procurement of Rain Garden Soil Sand, or Planting Pits and Beds Soil, the following information and samples are required for review and approval for each source:

1. Proposed material source and vendor.

2. A sample of the proposed material, taken with a representative of the Department, indicating the method of sampling and location of the sample.

3. The Contractor shall submit to the Engineer the name and location of the borrow (source) or stockpile site(s) and the estimated quantity of material available. The Contractor shall provide a notarized letter from the owner(s) of the proposed borrow site and/or stockpile site(s) indicating ownership of the proposed site(s) and a commitment to supply a specified minimum quantity of material for this project. Additionally, the supplier shall provide a certificate indicating the source materials for Planting Pits and Beds Soil exhibits no evidence of historic impacts, such as spills, or exhibits no visual or other indication of chemical or physical contamination (e.g., odors, sheen, etc.), and is not subject to the requirements of 6 NYCRR Section 360.13, signed by a NYS licensed PE/RLA or RA. To avoid delays in planting and seeding, the Contractor shall immediately begin to secure and test Rain Garden Soil and Planting Pits and Beds Soil at least one (1) month in advance of the material actually being needed on Site to allow sufficient time to blend the specified soil mix and make all the necessary adjustments in the mixing process.

4. Results of the organic content analyses conducted in accordance with the above referenced standard, Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, revised October 2011 or latest.

5. Results of the USCS soil texture gradation (gravel, sand, silt and clay) analyses and sand sieve analyses, with full reporting of all information in AASHTO sieve sizes, in accordance with the AASHTO T 27 Sieve Analysis of Fine and Coarse Aggregates and ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

6. Results of the pH tests conducted in accordance with the above referenced standard, USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0 2014.

7. Results of the soluble salts test conducted in accordance with the above referenced standard, Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

8. Results of the nutrient analyses test conducted in accordance with the above referenced standard, Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

9. Results of the inorganic nitrogen and total Kjedahl nitrogen tests conducted in accordance with the above referenced standard, USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0 2014.

10. Results of the acid-producing (iron sulfide) test conducted in accordance with the methodologies utilized by the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0 2014.

    NOTE: Due to the agricultural nature of some of the Quality Control testing the Contractor is notified that both Rutgers University and Cornell University can perform nearly all agricultural testing required, one exception may be the acid-producing test. Turnaround times for results may vary from standard soils testing. However, all agricultural testing procedures must be performed in accordance with the above referenced standards and the USDA Kellogg Soil Survey Laboratory Methods Manual (No. 42, 2014) AASHTO T 27 Sieve Analysis of Fine and Coarse Aggregates and the Recommended Soil Testing Procedures for The Northeastern United States, 3rdEdition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, revised July 2011 or latest. If another lab is proposed, the Contractor can submit written certification from the proposed lab certifying that the lab will utilize the same methodologies for soil testing as outlined in these specifications.

B. As delivery of Rain Garden Soil and/or Planting Pits and Beds Soil to the Site progresses, the following additional testing must be conducted by the Contractor on the material brought to the Site. Frequency of testing is one for every 50 CY delivered. If required soil volume for project is less than 50CY testing is still required prior to acceptance. Results of tests must be submitted to Engineer for review and approval.

1. Organic Content Testing in accordance with the Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

2. pH testing in accordance with the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0, 2014.

3. Soluble Salts testing in accordance with the Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

4. Results of the Nutrient analyses test conducted in accordance with the Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Station Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

5. Results of the Inorganic nitrogen and total Kjeldahl nitrogen tests conducted in accordance with the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0, 2014.

6. Results of the USCS soil texture gradation (gravel, sand, silt and clay) analyses and sand sieve analyses, with full reporting of all information in AASHTO sieve sizes, in accordance with the AASHTO T 27 Sieve Analysis of Fine and Coarse Aggregates and ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

7. Results of the acid-producing (iron sulfide) test conducted in accordance with the methodologies utilized by the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42 Version 5.0; 2014.

C. The Contractor shall submit to Engineer the materials and procedures for amending soil, if appropriate. Amendment of soil is only permitted to meet the nutrient and organic requirements of the specifications. Nutrient modifications are only permitted through the use of the approved contract specified organic fertilizer and the organic amendment permitted is leaf compost; no other organic amendment is permitted.

D. The Contractor shall submit quantity records on a weekly basis to Engineer.

E. Material failing the frequency testing must not be incorporated into the Work and be removed from the Site at the Contractor's expense.

F. Mulch for non-planted areas shall follow Specification 32 90 00 – Planting.

1.7 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MATERIALS

A. Rain Garden Soil and Sand must conform to the following standards:

1. Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Station Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, revised July 2011or latest.

2. USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0 2014.

B. Sand must consist of sand, free of organic material, loam, debris, frozen soil or other deleterious material which may be compressible. The sand must be of uniform quality, friable, free from hard clods, stiff clay, hard pan, partially disintegrated stone, stones, lime, cement, ashes, slag, concrete, tar residues, tarred paper, gasoline, motor oil, or other petroleum hydrocarbons, boards, brush, weeds, stalks, roots, sods, chips, sticks or any other undesirable material. Invasive, nonnative seed shall not be allowed in the clean sand material.

Clean sand must conform to the following gradation requirements:

U.S. Standard Sieve Size	Percent Passing by Weight
No. 8	100
No. 10	15-100
No. 40	0-70
No. 60	0-12

Uniformly graded sands, defined as having a uniformity coefficient (Cu = D60/D10) less than 6, are unacceptable.

Tests will be required and serve as a representative analysis for every 200 cubic yards of material utilized.

Clean sand must comply with the following requirements: No sand shall be delivered in a frozen or muddy condition.

1. Invasive, Nonnative Plant Species: Clean sand shall be free of invasive nonnative plant propagules or if present, sand shall be sterilized with documentation.

2. When clean sand otherwise complies with the requirements of the specifications but shows an organic matter deficiency of not more than one (1) percent, organic matter may be incorporated when and as permitted by the Engineer.

C. Planting Pits and Beds Soil shall be a sandy/loam, friable soil that has been removed to a depth of one foot (1') or less, if subsoil is encountered. Planting Pits and Beds Soil shall be of uniform quality, free from hard clods, stiff clay, hard pan, sods, partially disintegrated stone, lime cement, ashes, slag, concrete, tar residues, tarred paper, boards, chips, sticks, or any other undesirable material. No Planting Pits and Beds Soil shall be delivered in a frozen or muddy condition.

Planting Pits and Beds Soil shall be provided by Island Topsoil, Syosset, NY, Long Island Compost, Yaphank, NY; Natures Choice, Jersey City, NJ; New York Recycling and Materials, Inwood, NY or approved equal.

2.02 CHEMICAL AND PHYSICAL REQUIREMENTS

A. Rain Garden Soil is an integral part of the Green Infrastructure System; as such, certification of its material properties is subject to the testing protocols and shall be in accordance with above section (1.06 Submittals) for quality assurance testing. The QC requirements relative to Rain Garden Soil are detailed below**. The Contractor shall strictly comply with all requirements of its QA plan.** Sufficient lead time is required to develop an appropriate plan for mixing methodologies and ratios that will provide reliable results to meet the parameters listed below.

B. Rain Garden Soil

1. Rain Garden Soil shall be used for all GI practices that call for Rain Garden Soil.

2. Rain Garden Soil must be predominately sand (80-85% sand) as classified by the Unified Soil Classification System ("USCS"). Based on test results, a determination will be made to ensure that the sand fraction analysis results are capable of supporting proposed vegetation. Rain Garden Soil must be free of refuse, hard clods, woody vegetation, stiff clay, construction debris (of any kind), boulders, stones larger than 1-1/2 inches, chemicals, or other deleterious material toxic to any vegetation used on this project.

3. Rain Garden Soil must have a minimum organic content of three (3.0%) percent and a maximum of six (6.0%) percent. If the source soil requires amendment to meet the Rain Garden Soil organic content requirement, leaf compost will be the only approved admixture. No soil mixing will be permitted during or after Rain Garden Soil placement. Rain Garden Soil must be tested for compliance

with Contract specifications and submitted for approval prior to delivery to the Site.

4. The gradation of Rain Garden Soil must be determined by a laboratory using the methods of the ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). The gradation of the Rain Garden Soil as determined by USCS classifications must be within the following ranges:

Ranges:	0-8% gravel	
	80-85% sand	
	of which:	0-5% coarse sand
		55-75% medium sand
		20-40% fine sand
	5-10% silt	
	3-8% clay	

C. Additional Requirements for Rain Garden Soil:

1. The ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) is as follows:

Classification/sieve size:	75mm to 4.75 mm	gravel
	4.75 mm to 0.075 mm	sand
	0.075 mm to 0.002 mm	silt
	0.002 mm to 0.001 mm	clay

In addition to the above gradation the Contractor shall provide the percentage of particle sizes corresponding to U.S.D.A. classifications:

Coarse gravel	(75 mm to 19 mm)
Fine gravel	(19 mm to 4.75 mm)
Coarse sand	(4.75 mm to 2.00 mm)
Medium sand	(2.00 mm to 0.425 mm)
Fine sand	(0.425 mm to 0.075 mm)

2. The organic content of soils must be determined by a laboratory using the loss on ignition method as described in the Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No 493, Agricultural Experiment Station, Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest.

3. The pH value of Rain Garden Soil will be (5-7.0) as determined by an approved laboratory using soil pH (Water (1:1. V:V) procedures as described in the USDA Soil Survey Laboratory Methods Manual, Soil Survey Investigations

Report No. 42, version 5.0, November 2014. Amendment of soil to lower pH to meet Contract requirements is not permitted.

4. The soluble salt value of the Rain Garden Soil will be (0-.4mmhos cm-1) as determined by an approved laboratory using the soluble salt (1:2(V:V)) procedures as described in the Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia., revised July 2011 or latest..

5. The value for Kjeldahl Nitrogen will be as outlined below as determined by an approved laboratory using the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42, version 5.0; 2014.

   Kjeldahl N acceptable range is 0.06% to 0.25% (with nitrate (NO-3) form of nitrogen not to exceed 20 ppm).

6. The value for Macro (P, K) Nutrients will be determined by an approved laboratory using the procedures as described in the Recommended Soil Testing Procedures for the Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, revised July 2011 or latest. Ideal values for macro nutrients shall fall within the ranges indicated below:

P	80 lbs/acre to 100 lbs/acre
K	100 lbs/acre to 300 lbs/acre

   The value for Micro Nutrients (Mg, Ca, Mn, Zn, Cu and B) will be determined by an approved laboratory using the procedures as described in the "Recommended Soil Testing Procedures for The Northeastern United States, 3rd Edition, Northeast Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia, revised July 2011 or latest. Micro Nutrient values and the determination of their compliance with accepted industry standards will be at the discretion of the Engineer. Test reports for Micro Nutrients must be approved in writing by the Engineer prior to delivery of any soil to the Work Site.

7. An acid-producing soil test is required to determine the potential for decreases in soil pH after oxidation. The pH value of the solution shall be greater than 4.5 as determined by the USDA Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report No. 42 Version 5.0, 2014.

8. Rain Garden Soil must not contain any traces of hydrocarbons, petroleum products, chemically prohibited substances or any other elements considered to be toxic to any vegetation used on this project. The Rain Garden Soil must not smell of petroleum or give off other unnatural or toxic odors. Regardless of prior acceptance of sample material, if the Rain Garden Soil delivered to the Site seems suspicious in any way the Engineer will reject the material.

9. The Engineer shall check for discoloration and evidence of unacceptable contents. If the Engineer and/or Project Manager suspects that the soil possesses hazardous or contaminated characteristics, it will be rejected. All soil will be sent to a Laboratory which is certified by the NYSDOH Environmental Laboratory Accreditation Program (E.L.A.P.) for the selected analytical method.

   Soil tests shall be compared to N.Y.S. D.E.C. Guidance Values are known as "Recommended Soil Cleanup Objectives" or "Appendix A" (Revised 1/24/94), and consist of Table 1 for V.O.C.s, Table 2 for Semi-V.O.C.s, Table 3 for Organic Pesticides/Herbicides and P.C.B.s, and Table 4 for Heavy Metals. Test Methods EPA 8260C (VOCs), EPA 8270D (SVOCs), EPA 8081B (Pesticides), EPA 8082A (PCBs) and EPA 6010C (Metals). Final values will be determined by either a health-based level, or a concentration necessary to protect groundwater quality, whichever is lower.

   Uniformly graded sands, defined as having a uniformity coefficient (Cu = D60/D10) less than 6, are unacceptable.

   Tests will be required and serve as a representative analysis for every 200 cubic yards of material utilized.

   Clean sand must comply with the following requirements: No sand shall be delivered in a frozen or muddy condition.

D. Planting Pits and Beds Soil for Planting Pits and Beds

1. Organic Content: Planting Pits and Beds Soil shall contain at least three percent (3%) organic matter determined by loss on ignition, of moisture-free samples dried in accordance with the current method of the Association of Official Agricultural Chemists. The organic matter shall not exceed twelve percent (12%).

2. The acidity range shall be pH 6.0 to pH 7.5 inclusive.

3. Soil Textural Analysis: Planting Pits and Beds Soil shall consist of the following percentages of sand, silt and clay. Any soil that does not meet the requirements below will be rejected and removed from the site.

Sand (0.05 to 2 mm)	40% to 75%
Silt (0.002 to 0.05 mm)	15% to 65%
Clay (<0.002 mm)	20% maximum

4. Electrical Conductivity shall be a maximum of 1.0 mmhos/cm. A higher level would indicate excessive salt content and material will be rejected and removed from the site.

5. Nutrients: Planting Pits and Beds Soil test results shall show recommendations for soil additives or fertilizers to correct nutrient deficiencies as necessary. Soil additives and fertilizers shall be incorporated as necessary at the Contractor's expense. Follow the fertilizer recommendation as provided by the required laboratory.

   The Contractor shall at the direction and discretion of the Engineer, or when quantities exceed 50 cy, furnish a certified report of an approved Analytical Chemist showing the analysis of representative samples of the Planting Pits and Beds Soil which they propose to use. All samples are to be received by the Engineer and delivered to the laboratory, and the price bid shall include inspection and laboratory charges. Samples shall be submitted 48 hours prior to delivery of Planting Pits and Beds Soil.

   No Planting Pits and Beds Soil shall be delivered until the approval of samples by the Engineer, but such approval shall not constitute final acceptance. The Engineer reserves the right to reject on or after delivery any material that does not, in their opinion, meet these specifications.

6. Environmental Properties: Material must be sampled and analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory in accordance with the New York State Department of Environmental Conservation (NYSDEC) DER-10 protocols. For the full list of parameters in Title 6 of the Official Compilation of the New York Codes, Rules and Regulations (NYCRR) Part 375-6.8. Results of the analytical testing must meet 6 NYCRR Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs). The fill material must not have any physical evidence of contamination, including but not limited to petroleum or unnatural/toxic odors, visual signs of staining, or elevated photoionization detector (PID) readings. Regardless of prior acceptance of sample material, should the fill material that is delivered to the site seem suspicious in any way, the Engineer shall reject that material. Should the Contractor disagree with the Engineer's Determination, the Contractor may appeal.

   All topsoil shall be imported under the following conditions:

   • Material must be sampled at a frequency of one sample set (1 composite sample and 1 grab sample) per two hundred fifty (250) cubic yards of material or as prescribed by DER-10 table 5.4(e)10. The material must be tested at a NYSDOH ELAP-certified laboratory and must meet RRSCOs.

   • Environmental chemical analysis of all proposed material shall include, but not be limited to, USEPA Standard Test Methods for determination of total contaminant concentrations for the complete list of 6 NYCRR Part 375-6.8

parameters. Each composite sample shall be analyzed by USEPA Methods 8270 for Semi-Volatile Organic Compounds (SVOCs), 8081 for Pesticides/Herbicides, and 8082 for Polychlorinated Biphenyls (PCBs), and 6010 for Metals. Each grab sample shall be analyzed by USEPA Method 8260 for Volatile Organic Compounds (VOCs).

• The tested material must also meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d).

E. Sand

1. Sand for Precast Modular Sand Filter System shall comply with ASTM C-33 Concrete Sand Filter Media as well as the following:

a. Free of clay, silt, organic material, debris, and coatings

b. Washed and screened

2. TESTING REQUIREMENTS

a. Provide sieve analysis (ASTM C136)

b. Provide percent passing No. 200 (ASTM C117)

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. Prior to procurement of Rain Garden Soil and/or Planting Pits and Beds Soil and starting delivery of soil, all approvals for those items required in Section 1.6 entitled "SUBMITTALS" must have been given in writing to and accepted by the Engineer.

B. Prior to the placement of Rain Garden Soil, the subgrade must be accepted by the Engineer.

C. Hollows, depressions, and gullies shall be filled with acceptable material free from stones over two (2”) inches in diameter, cinders, rubbish, and other unsuitable material. All surplus material and debris shall be removed and disposed of as directed by the Engineer.

D. Loosen subsoil by scarifying, ripping or tilling using disks, harrows or other suitable equipment to a depth of (4”-6”) immediately before placing any soils for earthwork.

E. Rain Garden Soil must be evenly placed to the thickness and configuration as directed by the Engineer or as shown on the plans. Rain Garden Soil must not be placed when the subgrade or Rain Garden Soil is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to the proposed seeding, planting or soil structure.

F. The material delivered to the Site must be visually and continuously inspected by the Engineer during construction to ensure that it is consistently the same material previously approved and delivered to the Site. If any foreign or odor (organic, chemical, etc.) are detected, the Engineer reserves the right to refuse the material. If changes in material occur, such as texture, composition, moisture levels, etc., soil delivery must cease immediately, and the Contractor shall not incorporate the new material into the Work until the material meets these specifications and approved is by the Engineer. The Contractor shall test the new material as a new source and submit its results to the Engineer for his approval. If Engineer rejects the material, the Contractor shall immediately remove the material off the project Site at no additional cost to DEP. See CHEMICAL AND PHYSICAL REQUIREMENTS, Section 2.02.

G. Rain Garden Soil must be placed by gravity with no additional compaction. After Rain Garden Soil placement and initial grading, the GI practice will be fully saturated, allowed to drain down and then fully saturated again. Then more Rain Garden Soil will be placed as necessary to bring to final grade. After final grading, no heavy equipment, pickup trucks, or other construction vehicles will be permitted to travel on these completed areas. The Contractor shall, through mechanical raking and hand grading with rakes and shovels, grade all areas around fences, pipes and other structures in preparation for seeding or planting.

H. The Contractor shall, as part of the Rain Garden Soil spreading operation, mechanically rake and clean all undesirable materials from the Rain Garden Soil prior to planting operations.

I. The Contractor shall dispose of all undesirable materials raked from the Rain Garden Soil, in accordance with the Contract specifications.

3.02 PLANTING PITS AND BEDS SOIL PLACEMENT

A. Preparation of Subgrade: Hollows, depressions, and gullies shall be filled with acceptable materials free from stones over two inches (2”) in diameter, cinders, rubbish, and other unsuitable materials. All surplus material and debris shall be removed and disposed of as directed by the Engineer.

Loosen subsoil by scarifying , ripping, or tilling using disks, harrows or other suitable equipment to a depth of (4”-6”) immediately before placing any Planting Pits and Beds Soil . Repeat cultivation in area where equipment used for hauling and spreading Planting Pits and Beds Soil has compacted soil.

B. The Contractor shall notify the Resident Engineer a minimum of 48 hours prior to the intended Planting Pits and Beds Soil delivery date. No Planting Pits and Beds Soil shall be delivered to the site until approval of samples by the Engineer, but such approval shall not constitute final acceptance. All imported Planting Pits and Beds Soil shall be delivered in trucks and will be subject to visual inspection and additional testing. The Planting Pits and Beds Soil shall not be spread until the Engineers’ sampling and testing is completed, unless otherwise directed. The Engineer reserves the right to reject any Planting Pits and Beds Soil which does not fall within acceptable limitations of this specification and the

initial submittal to design including the Engineer approved sample and the approved test report. Where the Planting Pits and Beds Soil is rejected, it shall be immediately removed from the site. Where it has been determined by the Landscape Construction Unit that soil amendments are allowable, the correction shall be made at the Contractor's expense. Additional testing after amending shall also be at the Contractor's expense.

C. Placement and Spreading of Planting Pits and Beds Soil : No Planting Pits and Beds Soil shall be handled when, in the opinion of the Engineer, it is too wet.

D. Preparation of Final Grade: Thoroughly cultivate Planting Pits and Beds Soil to minimum depth of (4") by rototilling or hand methods where compaction has occurred and to break up all soil lumps. Float until surface is smooth.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 92 19
SEEDING

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide all labor, materials, equipment and incidentals required for furnishing and installing seed, straw mulching and mulch binder in a way that obtains optimal germination and long-term success according to the Contract Documents and as directed by the ENGINEER.

B. The Contractor shall seed all disturbed areas, as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

B. Section 32 90 00 – Planting.

C. Section 32 90 05 – Soil Mixes

1.03 PAYMENT

A. The price bid for SEEDING shall be per SQUARE YARD, and shall include the cost of all labor, materials, equipment including seed, limestone (where needed), commercial fertilizer low phosphorus (slow release), mulching, disposal of surplus materials, water, and incidental expenses necessary to complete the Work, in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. Payment for work performed under SEEDING shall be made as follows:

70% - after initial seeding

30% - after final inspection of seeded area

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

CONTRACT GI-CONS-7
SECTION 32 92 19
SEEDING

1.06 SUBMITTALS

A. The Contractor shall submit Working Drawings in accordance with the requirements of Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

B. The Contractor is required to perform a separate purity and germination tests on the seed mixes to be used on this project prior to submitting the seed mix and supplier. The results of this germination test shall be included in with the information submitted to the Engineer for review and acceptance. The Contractor is advised that these tests can run two months or more and should be prepared to have these tests completed in sufficient time for the next seeding season. Seed shall conform to all applicable state and federal regulations and to test provisions of the Association of Official Seed Analysts.

C. The Contractor shall submit proposed procedure and where applicable, manufacturer's literature, to perform lawn aeration.

1.07 QUALITY CONTROL

A. All seed shall be interagency certified under the auspices of a State Seed Improvement Cooperative and must bear their seals of certification on bag. Permanent seed shall be seventy-five (75%) percent Pure Live Seed minimum. Weed content of seed lots shall not exceed 0.25 percent. All seed shall be free of noxious weeds. Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in sealed standard bags or containers with germination and purity percentages clearly labeled. Contractor shall notify the Engineer forty-fight (48) hours in advance of delivery of all plant material.

B. Seed shall be clean and fresh and delivered to the Site in the original, unopened bags showing the net weight, composition of the mix, suppliers name and guarantee of analysis. Seed shall be delivered and stored in original unopened packages, kept dry and not opened until needed for use. Damaged or faulty packages shall not be used and will be rejected. Seed shall have been harvested for planting in the current growing season and shall have been packed within the last nine (9) months.

C. Store and cover materials to prevent deterioration. Seed that is wet or moldy or that has otherwise been damaged in transit or storage shall be replaced at no additional cost to the City.

CONTRACT GI-CONS-7
SECTION 32 92 19
SEEDING

PART 2 PRODUCTS

2.01 MATERIALS

A. Seed Mixture for Natural Area Bioretention shall be the following:

Bioretention Seed Mix

Scientific Name	**Common Name**	**% of Mix**
Schizachyrium scoparium	Little Bluestem	15
Carex vulpinoidea	Fox sedge	10
Elymus virginicus	Virginia wildrye	10
Panicum clandestinum	Deertongue	10
Panicum rigidulum	Redtop panicgrass	10
Juncus effuses	Soft rush	10
Asclepias tuberosa	Butterfly milkweed	5
Carex scoparia	Blunt broom sedge	5
Eupatorium perfoliatum	Boneset	5
Juncus tenuis	Path rush	5
Rudbeckia hirta	Black eyed Susan	5
Solidago rugosa	Rough-leaved goldenrod	5
Symphytrichum novae-angliae	New England aster	3
Penstemon digitalis	Tall white beardtongue	2

Bioretention seed mix shall be applied as a rate of 30 lbs/ac with a cover crop applied at a rate of 15 lbs/ac. Nurse/cover seed for the permanent seed mixture shall consist of oats (*Avena sativa*) during spring seeding season and certified Canada wild rye (*Elymus canadensis*) during fall seeding season.

B. Seed Mixture for Restoration shall be the following:

Restoration Seed Mix

Scientific Name	Common Name	% of Mix
Festuca ovina	Sheep fescue	64
Lolium multiflorum	Annual ryegrass	17
Linum perenne spp. lewisii	Perennial blue flax	8
Chrysanthemum leucanthemum	Oxeye daisy	2
Coreopsis lanceolate	Lanceleaf coreopsis	2
Rudbeckia hirta	Black eyed Susan	2
Chamaecrista fasciculata	Patridge pea	1
Chrysanthemum maximum	Shasta daisy	1
Papaver rhoeas	Corn poppy	1
Asclepias tuberosa	Butterfly milkweed	0.6
Achillea millefolium	Common yarrow	0.5
Symphyotrichum oblongifolium	Aromatic aster	0.4
Eupatorium coelestinum	Mistflower	0.2
Penstemon hirsutus	Hairy beardtongue	0.1
Pycnanthemum tenuifolium	Narrowleaf mountainmint	0.1
Rudbeckia fulgida	Orange coneflower	0.1

Restoration Seed Mix shall be applied as a rate of 30 lbs/ac with a cover crop applied at a rate of 15 lbs/ac. Nurse/cover seed for the permanent seed mixture shall consist of oats (*Avena sativa*) during spring seeding season and certified Canada wild rye (*Elymus canadensis*) during fall seeding season.

C. Seed Mixture for Grass Areas or Grass topped Green Infrastructure:

Grass seed shall be fresh, recleaned seed of the latest crop, mixed in the following proportions by weight and meeting the following standards of pure live seed content (Purity and Germination) and maximum allowable weed seed content. All seed shall be free of noxious weeds and undesirable grasses.

GRASS SEED MIXTURE

Percent By Weight	Grass Seed	Purity	Germination	Maximum Weed Seed
60%	TALL FESCUE – One or more of the following varieties: Apache II, Arid 3, Cochise III, Coronado Gold, Falcon IV, Justice, Jaguar III, Lancer (SH), Masterpiece, Rebel IV, Rebel Jr. (SH), Rebel Sentry, Rembrandt, Tomahawk E+, RTF or approved equal.	98%	85%	0.25%
20%	BLUEGRASS – One or more of the following varieties: Able I (SH), Blacksburg, Glade (SH) Moonlight, Midnight, America (SH) Brilliant, Ram (SH), Touchdown (SH), Warren's A-34 (SH), Bristol (SH), Lofts 1757 (SH) or approved equal.	98%	80%	0.10%
20%	PERENNIAL RYEGRASS – One or more of the following varieties: Brightstar II, Manhattan 4, Citation fore, Elfkin or approved equal.	98%	85%	0.25%

NOTE: The cultivars followed by "(SH)" exhibit better shade tolerance than other varieties, under moderate shade.

All seed shall be interagency certified under the auspices of a State Seed Improvement Cooperative and must bear their seals of certification on each fifty-pound (50 lb.) bag. All Grass Seed shall be delivered in sealed standard size bags of the vendor, showing weight, analysis, and name of vendor. It shall be stored as directed by the Engineer, in such a manner that its' effectiveness will not be impaired.

The Engineer reserves the right to reject, on or after delivery, all material which does not, in their opinion, meet these specifications.

The rate of seeding shall be ten pounds (10 lbs.) per one thousand (1,000) square feet.

D. Ground Limestone (Calcium Carbonate): shall have the following analysis: at least fifty percent (50%) shall pass a 200 mesh sieve, at least ninety percent (90%) shall pass a 100 mesh sieve, and one hundred percent (100%) shall pass a ten (10) mesh sieve. Total carbonates shall not be less than eighty percent (80%) or 44.8% Calcium Oxide equivalent.

For purposes of calculation, limestone may be substituted at the discretion of the Engineer, when wind conditions exceed five (5) miles per hour.

The Contractor shall, at the direction and discretion of the Engineer, furnish a certified report of chemical analysis of representative samples of the limestone which is proposed. All samples are to be taken by the Engineer and delivered to the laboratory; the price bid shall include inspection and laboratory charges. No limestone shall be delivered until the approval of samples by the Engineer, but such approval does not constitute final acceptance of the material. The Engineer reserves the right to reject, on or after delivery, and material which does not, in their opinion, meet these specifications.

All limestone shall be delivered in standard size bags of the manufacturer showing weight, analysis, and name of the manufacturer. It shall be stored in such a manner that its effectiveness will not be impaired, as directed by the Engineer.

The rate of application of limestone per thousand (1,000) square feet shall be as follows, depending on the Hydrogen Ion concentration (pH) shown by a pH test (pH test to be provided by the Contractor at no additional cost to the City).

pH	**RATE (LBS.)**
Below 5.0	160
5.0 to 6.0	80
Over 6.0	0

E. Commercial Fertilizer Low Phosphorus (Slow Release): shall have the following composition by weight: Nitrogen (N) shall be min. 4% - max. 10%, of which min. 50% is slow-release; available Phosphorus (P) shall be min. 0% - max. 2%; and soluble Potash (K) shall be min. 4% - max. 12%.

Fertilizer shall be a pesticide free (no weed-and-feed) product such as Roots Healthy Turf (8-1-9) as manufactured by Lebanon Turf, Lebanon, PA; Safer Ringer Lawn Restore II 10-0-6 as manufactured by Woodstream corp., Lifitz, PA; or approved equal.

All Commercial Fertilizer Low Phosphorus (Slow Release) shall be delivered in standard size bags of the manufacturer, showing weight, analysis, and name of manufacturer. It shall be stored as directed by the Engineer in such a manner that its' effectiveness will not be impaired. Application of any fertilizer on lawns or non-agricultural turf within 20 feet of a water body or on paved surfaces is restricted and may not be applied unless there is a buffer at least 10 feet wide of planted or naturally occurring vegetation, such as shrubs, trees, and plants between the area receiving fertilizer and the water. Fertilizer shall not be applied between December 1 and April 1.

The rate of application:

1. Two (2) applications of acceptable commercial fertilizer shall be applied by machine, each application at the rate of ten (10) pounds per thousand (1,000) square feet or as recommended by the manufacturer. The first application shall be made at the time of installation of seed.
2. The second application shall be made approximately six (6) months after the first application. This treatment shall take place during the next appropriate fertilizing season; that is the following Spring or Fall, and shall be subject to the direction of the Engineer and/or Landscape Architect.
3. The second application shall be applied to the surface only. Incorporation shall be achieved by thoroughly watering the entire area after application. The Contractor shall provide all labor and materials including water if not available from NYC sources.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

A. Seed materials shall be inspected by the Engineer upon arrival at the job Site and prior to planting. Any materials not in compliance with specifications shall not be accepted and shall be removed from the job Site immediately.

B. All seed materials shall be protected from drying out and from wind damage during delivery.

C. All areas shown to receive seed on Contract Drawings and all areas which are disturbed and not planted shall be seeded.

D. Seedbed Preparation – Scarify all compacted areas and remove all debris and obstacles such as rocks and stumps. The seed bed shall be graded to true lines, free from all unsightly variations, bumps, ridges, or depressions.

E. Apply seed at the rate(s) specified in this specification.

F. Time of Seeding – Permanent seeding shall be done within 15 days of final construction activities. Optimum seeding times are in the spring from March 21 – May 20 and in late summer and early fall from August 25 – October 15. If construction is completed during mid-summer, seeding may be done if watering will be provided. After October 15 and up to March 21, the straw mulch should be applied until the permanent seeding can be done during the recommended seeding dates. All seeding is to be done in moderately dry to moist (not wet) soil and at times when the wind does not exceed a velocity of five (5) miles per hour.

G. Method of Seeding – Seed shall be broadcast by hand or mechanically using a drop-hopper.

H. Following the seeding operation, fertilizer shall be applied as needed, according to recommendations from soil testing. When required, 10-10-10 fast release fertilizer shall be broadcast at a rate of 400 lbs./acre throughout the seeded area by hand or mechanically using a cyclone broadcaster. Seed shall be watered as recommended by the seed manufacturer to achieve specified growth coverage.

I. Lawn aeration to be performed by a core aeration method. Lawn shall be cored at a depth of approximately 2” to 3”, and approximately every 3” in order to aerate thatched areas.

3.02 AERATE AND SEED COMPACTED LAWN

A. The Contractor shall cut grass or other existing vegetation to a three-quarter inch (3/4”) height and rake clean. Lawn waste generated shall be composted through the use of a mulching lawn mower or at a state approved off-site facility. Planting Pits and Beds Soil shall be applied to depressed areas as directed to provide a uniform gradient.

B. The Aerator should be equipped with three-quarter inch (3/4”) hollow tines 3 to 4 inches long and passed over the area two (2) times in different directions, as directed by the Engineer. If the full depth of penetration cannot be achieved, the Contractor must increase the soil moisture content by watering the area to a sufficient depth. Within the Tree Protection Zone, or as directed by the Engineer, the Contractor may be directed to utilize a scarifying machine in place of an aerator in order to limit surface penetration to the top one or two inches of soil. The area should be raked smooth after aerating to break up all coil cores generated by the aerating operation.

3.03 LANDSCAPE GUARANTEE AND REPLACEMENT

A. Watering must take place throughout the guarantee period and be continuous until the planting is accepted. Plant material will not be accepted unless there is healthy growth and satisfactory foliage conditions.

B. Maintenance shall include watering, weeding, cultivating, pruning, removal of dead plant material, replacement of unhealthy plants and resetting where required to maintain optimum health and well-kept appearance. The removal of non-native and/or invasive plant species shall be conducted as they appear on Site.

C. During the maintenance period all plant material shall be protected from insects and disease to maintain optimum health.

D. Acceptable seeding establishment shall be 85% coverage of the seeded area(s) with the seeded species. Any area(s) not meeting this requirement shall be reseeded with the specified seed mix at the Contractors expense.

3.04 FINAL ACCEPTANCE

A. Plant material must be thriving. Planting beds must be free of invasive/nonnative plant species.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 92 19.01
SEEDING – HARDING PARK ONLY

PART 1 GENERAL

A. Under this Item, the Contractor shall furnish and install BROADCAST NATIVE SEED in accordance with the plans for X262 Harding Park Gildersleeve Ave. & Leland Ave and specifications, and as directed by the Engineer or their designated representative.

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.02 PAYMENT

A. The quantity of BROADCAST NATIVE SEED to be paid for under this Item shall be the area seeded, measured in SQUARE YARDS, in accordance with the plans, specifications, and directions of the Engineer or their designated representative.

The price bid shall be a unit price per **SQUARE YARD** of area broadcast seeded and shall include purchase of native seed, site soil preparation, broadcast seeding, mulching, watering, replacing all seed and reseeding, mowing, and all other work incidental thereto, in accordance with the plans and specifications, to the satisfaction of the Engineer or their designated representative.

The price of water, regardless of the source, shall be included in the bid price. No extra payment shall be made for water obtained from the Contractor's own source.

REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.03 REGULATORY COMPLIANCE (NOT USED)

1.04 SUBMITTALS

Submittals shall be as follows (specific submittal requirements described in this specification):

A. Native Seed: Detailed documentation of seed provenance for each seed lot shall be submitted within 30 days of award of contract. Documentation shall include the following information:

1. Seed provenance documentation for each seed lot shall be submitted within 30 days of award of contract. Documentation shall include the following information:
    a. Species
    b. Date of collection
    c. Location/address of collection
    d. GPS coordinates of collection
    e. Population size estimate
    f. Sample size collected
    g. Community & habitat type
    h. Land use

i. Soil texture
j. Seed quality assessment
k. Associated species

2. Seeding Plan: A Seeding Plan MUST be submitted at least six (6) weeks prior to seed broadcast seeding commencement. No soil preparation for seed broadcasting operations as per the below 3.01 Site Preparation Section of this specification shall commence until the Seeding Plan has been received and approved IN WRITING by the Engineer. The Seeding Plan must include the following:

   a. Broadcast seeder's specifications for approval
   b. Calculations as per "1.06 Quality and Quantity" section of this Specification.
   c. The setting that will be used on the broadcast seeder based on the bulk seeding rate for each species to deliver the correct amount of seed to the site.
   d. A copy of the label from the purchased seed bag(s).
   e. The approved time-frame for seed installation.

   Upon approval of the seeder and the Seeding Plan by the Engineer, the Contractor shall instruct the supplier to mix the seed per the approved Seeding Plan.

3. Straw Mulch: At least four (4) weeks prior to intended start of seeding operations, the Contractor shall submit a representative sample (i.e.- two (2) one-pound zip-lock bags labeled with Contractor's name and contract number on each bag in permanent ink) of the straw mulch proposed for use to the Engineer for approval. No straw mulch shall be delivered to the seeding site until the approval of samples by the Engineer, but such approval shall not constitute notice of substantial completion. The Engineer reserves the right to reject on or after delivery straw mulch or ANY MATERIALS which do not meet these specifications to their satisfaction

1.05 QUALITY AND QUANTITY

A. Seed shall be fully cleaned, in the original, unopened bags and with an informational label permanently affixed to each bag. Damaged or faulty bags will be rejected. All seed shall NOT be of a released selection, cultivar or named variety. All seed shall be free of noxious weeds and undesirable grasses. Seed shall have less than 1% of other crop seed. Seed must be properly stored by the Contractor in a cool, dry area free of rodents until needed by the Contractor. All seed will be bagged and labeled with the following information:

- Species name/Common name
- Origin
- Net weight
- Percent Pure Seed (Purity)
- Percent weed seeds
- Percent other crop seeds
- Percent inert matter

- Percent germination
- Percent dormant seed
- Germination test date
- Seeds/Pound

The information contained on the label shall be derived from an official seed analysis laboratory report from an accredited seed testing laboratory. A copy of the official seed analysis laboratory report shall be submitted to the Engineer for each species constituting the mix prior to the purchase of seed by the Contractor. Copies of all seed analysis reports shall be submitted by the Contractor as part of their Seeding Plan, no later than six weeks prior to the date when the Contractor intends to commence seeding operations (see Seeding Plan and Submittal in Section 1.05 of this Specification). Bulk seed meeting these specifications is available from Ernst Conservation Seeds, Meadville, PA, or an approved equal.

B. The Contractor shall submit the below calculations as part of their Seeding Plan for review and approval by the Engineer prior to placing an order for the native seed with the seed supplier. **The Contractor shall have the seed mixed by the vendor only after the Contractor's broadcast seeder equipment specifications and the below Calculations have been submitted as part of the Seeding Plan AND approved by the Engineer (see Seeding Plan and SUBMITTALS in Section 1.05 of this Specification).**

Percent germination, percent dormant seed, and percent purity (sometimes called percent pure seed) results from the above official seed analysis laboratory report are necessary to determine a current Percent Pure Live Seed (%PLS) value for each species. **Test results must be from within the last twelve months.**

1) Percent viability in this calculation shall be determined from the test results by adding the percent germination value and the percent dormant seed value:

Percent viability = Percent germination + Percent dormant seed

NOTE: If a percent dormant seed value is not provided in the test results, use the percent germination value alone as the percent viability in the following PLS calculation.

2) Percent of Pure Live Seed (%PLS) is the product of the percent (%) purity (from the test results) multiplied by the percent (%) viability (from calculation #1), divided by 100.

%PLS= (% purity x % viability)/100

NOTE: %PLS values must be calculated for each species individually

3) Bulk seeding rates for each species are to be determined by dividing the PLS/acre seeding rate provided above for each species by the %PLS of each seed lot (from calculation #2 above).

Bulk Seeding Rate for each species = Pounds PLS (species) per acre/ %PLS

NOTE: The bulk seeding rate must be calculated for each species individually prior to blending the seed mix and sowing.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. The Contractor must securely store the purchased seed away from vermin (including rodents), moisture and excessive heat or cold. The Engineer reserves the right to inspect the contractor seed storage area and any seed found improperly stored as determined by the Engineer or their designated representative or infested by vermin or insects shall be rejected. Rejected seed must be replaced at the contractor's expense. The cost of replacement seed will be borne solely by the Contractor. Replacement seed must meet all the same specifications as the original purchased seed.

B. Seed will be rejected by the Engineer or their designated representative if delivered to the site in an unacceptable condition such as open, damaged or wet bags, or if bags are damaged on site by improper handling or storage. All rejected material shall be marked by the Engineer or their designated representative and will be replaced with acceptable material at the Contractor's expense. There shall be no additional cost to the City. Seed shall be purchased from Ernst Conservation Seeds, Meadville, PA, or approved equal.

PART 2 PRODUCTS

2.01 Native Seed: All seed shall be derived from a minimum of five (5) wild populations per species, each originating from within a 150-mile radius of the project site. Seed collected from each wild population shall be sampled randomly from a minimum of 50 individuals in each population.

The bulk quantity of the seed for mixes to be purchased shall be determined as detailed under "1.06 Quality and Quantity" in this specification to meet the required seeding rate of Pure Live Seed (PLS) per acre. The composition and Pure Live Seed application rates of each species in the seed mixes shall be as shown in the construction plans, or as otherwise specified by the Engineer.

2.02 Straw Mulch: Only straw mulch shall be accepted. Straw mulch shall be stalks of oat or wheat, free from noxious weeds and other material. Mulch shall be well cured to less than twenty (20) percent moisture by weight and furnished in air-dry condition and can be installed with commercial mulch blowing equipment. Straw shall contain no fertile seed.

Four (4) weeks prior to intended commencement of any seeding operations, the Contractor shall submit a representative sample (i.e.- two (2) one-pound zip-lock bags labeled with Contractor's name and contract number on each bag in permanent ink) of the straw mulch proposed for use to the Engineer for approval (See 1.05 SUBMITTALS). No straw mulch shall be delivered to the seeding site until the approval of samples by the Engineer, but such approval shall not constitute notice of substantial completion. The Engineer reserves the right to reject on or after delivery straw mulch or ANY MATERIALS which do not meet these specifications to their satisfaction.

2.03 Broadcast Seeding Equipment: Seeding shall be performed using hydraulic, cyclone, knapsack hand-operated or other broadcast type seeders. The choice of broadcasting equipment shall be scaled to the area to be seeded to maximize efficiency of operations. The Contractor shall submit the broadcast seeding equipment specifications as part of the Seeding Plan six weeks prior to the intended commencement of seeding operations for approval by the Engineer (see Seeding Plan in 1.05 Submittals section).

PART 3 EXECUTION

3.01 SITE PREPARATION

A. Site Acceptance: The Engineer shall approve the area for seeding PRIOR TO soil preparation for seeding operations.

Any site where the Contractor has not performed invasive species removal under this contract must be inspected together by the Engineer and the Contractor and approved prior to seeding.

B. Soil Preparation: Prior to seeding, the area to be seeded shall be tilled or disced to loosen the top four (4") inches of soil. The tilled or disced area shall be fine-tilled or power-raked to open the soil and remove rocks, roots, top growth, or debris over two inches (2") in size, in any dimension. The chain method or another suitable and pre-approved method of cultivation shall be employed to loosen, rough grade, and prepare the seedbed.

After seed bed preparation, areas to be seeded shall be "tracked" with tracked crawler or rubber-tired equipment parallel to contours to make depressions to receive the seed.

THE PREPARED AREA MUST BE INSPECTED AND APPROVED BY THE ENGINEER OR THEIR DESIGNATED REPRESENTATIVE PRIOR TO SEEDING.

3.02 INSTALLATION

A. No broadcast seeding shall be done, except in the presence of the Engineer or their designated representative. Any broadcast seeding performed in a location not on the contract list and without the knowledge of the Engineer or their designated representative shall not be approved for payment.

B. The Engineer or their designated representative is to be notified in writing not less than five (5) working days in advance before any broadcast seeding is to commence. Seed shall be sown during the months of November or December as directed by the Engineer.

C. Seeding Plan: A seeding plan MUST be submitted at least six (6) weeks prior to broadcast seeding commencement. No Site Preparation as per "3.01 Site Preparation" section of this specification shall commence until the Seeding Plan has been received and approved in writing by the Engineer. See Seeding Plan in 1.05 Submittals section of this specification for details.

D. Timing of Seeding Operations: In order to minimize invasive species regeneration on site, the Contractor shall time the seeding application to coincide with completion of any Invasive Removal Items of this contract and as directed by the Engineer. See "3.01 Site Preparation" section of this specification. The time-frame of installation shall be included in the Seeding Plan.

E. Seeding Methods & Requirements: Seed method shall be broadcast seeding. Seeding shall be performed using hydraulic, cyclone, knapsack hand-operated or other broadcast type seeders. The choice of broadcasting equipment shall be scaled to the area to be seeded to maximize efficiency of operations and shall be approved by the Engineer.

F. Six (6) weeks prior to the commencement of seeding operations, the Contractor shall submit to the Engineer for approval their Seeding Plan for applying the seed including the specifications for the broadcast seeder. Upon approval of the seeder and the Seeding Plan by the Engineer, the Contractor shall instruct the supplier to mix the seed per the approved Seeding Plan Calculations.

G. All seeding shall be performed in moderately dry to moist soil conditions at a time when the wind velocity does not exceed five miles per hour (5 mph) as directed by the Engineer or their designated representative. The Engineer or their designated representative may direct the Contractor to postpone seeding until soil moisture and wind velocity conditions are acceptable.

H. Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate, guarding against missed areas and overlaps. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. The contractor shall cover seed uniformly to a maximum depth of one-half (1/2) inch by means of spike-tooth harrow, cultipacker, rake or other approved devices.

I. Native Seed: Dry seed shall be uniformly broadcast at the application rate of 24.41 lbs PLS/acre (lbs Pure Live Seed per acre). The Contractor shall install seed at the bulk seeding rate as calculated and accepted by the Engineer in the Contractor's submitted Seeding Plan (See Seeding Plan in 1.05 Submittals section of this specification for details).

J. Straw Mulch: The Contractor shall furnish and place mulch in accordance with the plans, specifications, and as per the Engineer or their designated representative. All mulching shall be done concurrent with or immediately following seeding operations. Mulch shall be spread uniformly at the rate of one point five (1.5) tons in net dry weight per acre. Mulch shall be spread by hand, blower-type mulch spreader or other approved method. Equipment will not be allowed that does not properly distribute the weight of the equipment over a large area. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes and continued uniformly until the area is covered. The mulch shall not be bunched or clumped and should not exceed fifty (50%) percent ground cover.

K. Tackifier: No tackifier shall be used unless otherwise directed.

L. Watering At Installation: At the discretion of the Engineer, the Contractor shall water the site exactly four days after completion of seeding if there is only a trace of rain or less as determined by the Engineer within 3 days of completion of seeding operations. Contractor must have a portable, truck-mounted and pump-driven hydraulic watering system, with proper nozzles to ensure gentle watering of the seeded area and with a tank size sufficient to water the entire seeded area at 6,000 gallons per acre (¼-inch) or the ability to refill the tank as approved by the Engineer (see below regarding City hydrants). The water truck shall be pre-approved by the Engineer. No hand watering shall be permitted. If necessary for areas not accessible to water from a truck-mounted tank, a watering irrigation system MUST be installed with proper nozzles to ensure gentle watering of the seeded area.

Where water is supplied from City hydrants, the Contractor shall obtain a hydrant permit from the Department of Environmental Protection. Permits are issued for a 30-day period, and the Contractor is responsible for keeping the permits current. The permits are available from each borough office.

The Contractor must have all tools necessary for using city hydrants in their possession at time of seeding to ensure that this specification is adhered to. If conditions do not allow the use of New York City water sources, the Contractor must obtain their own source of water. No direct payment shall be made for water obtained from other than city sources, but the cost thereof shall be deemed included in the bid price of this item and other various items of the contract.

3.03 EVALUATION & INSPECTION

A. Inspection shall occur during the months of May, June, or July, one (1) cold season (Dec 1st - March 1st) after broadcast seeding has been completed. Therefore, the inspection will always occur in May, June, or July of the FOLLOWING YEAR after seed installation regardless of the month seed installation occurred. Native seed shall be inspected and acceptance shall be provided for areas in which approved growth is achieved as determined by the Department of Parks and Recreation (NYC Parks). Additional inspections will be held until the end of the guarantee period (see below Maintenance & Guarantee). If inadequate growth as determined by the Engineer or NYC Parks is observed in the area seeded, the contractor shall re-seed at half the original seeding rate in the months of March, April, May, September, October, or November. Any additional native seed required must be purchased by the Contractor and meet the specifications under the "Native Seed" paragraph of the "Products" section of this specification.

3.04 MAINTENANCE AND GUARANTEE

A. The Contractor shall perform seed installation, watering, and mowing required to achieve good growth and establishment of the native seed.

B. Re-seeding: After inspection, the Contractor shall reseed any areas which fail to show growth satisfactory to NYC Parks and as directed by the Engineer with the specified mixture of seed up to twice per year, but not to exceed twice per year in any one location, until notice of Substantial Completion of the Contract. Reseeding shall be at no additional cost to the City and shall be included in the Contractor's bid price for this item. Any additional native seed required must be purchased by the Contractor and meet the specifications under the "Native Seed" paragraph of the "Products" section of this specification.

C. There shall be a two (2) year guarantee on the seeded area commencing after the notice of Substantial Completion and the completion of the whole work of this Contract. After notice of Substantial Completion, the seeded area shall be inspected periodically during the guarantee period by the Engineer and when instructed, the Contractor shall reseed any area failing to show growth satisfactory to the Engineer or NYC Parks in the next appropriate month even when the next month falls outside the two-year period. This reseeding shall occur as many times as necessary but not to exceed twice per year in any one location throughout two-guarantee period. Reseeding as part of the two-year guarantee shall be at no additional cost to the City and shall be included in the Contractor's bid price for this item.

D. Watering: Water shall be free from oil, have a pH not less than 6.0 nor greater than 8.0 and shall be free from impurities injurious to vegetation.

E. Watering shall also take place until notice of Substantial Completion AND throughout the two-year guarantee period following notice of Substantial Completion, and shall be at a rate of at least 6,000 gallons per seeded acre at a MINIMUM of two week intervals from May 1st to December 1st unless otherwise directed by the Engineer. The Engineer may order more or less watering based on weather conditions, resulting soil water content, or

other factors. If drought conditions warrant, the Engineer may order more frequent watering than scheduled or during non-scheduled periods. A biweekly watering schedule must be submitted to the Engineer prior to May 1st or upon completion of the seeding operations if after May 1st (see Submittals). See "Watering At Installation" section above for information about water supplied by NYC hydrants.

F. Selective Spot Herbicide Application: Please see Specification 31 31 19.13 – Chemical Vegetation Control.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 32 94 13
STEEL EDGING

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes the requirements for STEEL EDGING. The Contractor shall furnish and install STEEL EDGING in accordance with the plans and specifications and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

1.03 PAYMENT

A. The price bid shall be a unit price per LINEAR FOOT of STEEL EDGING furnished and incorporated in the work, and shall include furnishing all labor, material, and equipment, including the cost of all stakes, laps, and all necessary and incidentals necessary to complete the work in accordance with the plans and specifications, to the satisfaction of the Engineer.

B. Excavation, if required, shall be paid for separately under its own Contract item.

1.04 SUBMITTALS

A. The Contractor shall furnish one (1) sample of steel edging, a minimum of six inches in length, before starting work for approval. Steel edging used on the work shall conform to the approved samples in all aspects, in the opinion of the Engineer.

1.05 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 STEEL EDGING

A. Steel edge shall consist of lengths of hot rolled steel sections, one quarter (1/4”) inch thick by five (5”) inches in depth by sixteen (16’) feet in length. Tapered steel stakes, fifteen (15”) inches long, shall be spaced thirty (30”) inches on center along the length of the edging. Joints between edging strips shall be overlapped as indicated on the standard detail sheet. All edging and stakes shall be shop painted with weather resistant paint or powder coated. Color shall be green unless otherwise shown on drawings or directed by the Engineer. Steel edging shall be “Steel Landscape Edging” by Border Concepts, Charlotte, NC; “Steel Landscape Edging” as manufactured by Sure-Loc Edging Corporation, Holland, MI, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. The steel edging shall be installed true to line and grade in accordance with the designs indicated on the plans. All bends and curves shall be smooth and uniform. Where bends or curves are of such radius as to make field bending impracticable, they shall be made in the shop. All joints shall be welded as shown on the detail sheet.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 01 12.11
LEAKAGE DETECTION

PART 1 GENERAL

1.01 REQUIREMENTS

A. Leakage testing for all pipelines and structures required to be watertight or airtight.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 22 10 00 – Plumbing Piping

B. Section 33 42 11 – Stormwater Gravity Piping

C. Section 33 05 19 – Ductile Iron Utility Piping

D. Section 33 42 10 – Reinforced Concrete Sewer Pipe

1.03 PAYMENT

A. There will be no separate payment for the work specified herein. The costs shall be considered incidental to the work and included in the prices bid for the various contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ACI 350.1-10 - Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures and Commentary

B. AWWA C600-10 - Installation of Ductile-Iron Mains and Their Appurtenances

C. New York City Building Code

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit Shop Drawings and the following:

1. Testing procedures shall be submitted for approval at least 30 days prior to the test.

2. Testing Report: Prior to placing the piping system or structure 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.

1.07 PERFORMANCE REQUIREMENTS

CONTRACT GI-CONS-7
SECTION 33 01 12.11
LEAKAGE DETECTION

A. Written Notification of Testing: Provide written notice at least two weeks prior to date of testing.

B. No tests shall be conducted without an approved written procedure.

C. All leakage tests shall be conducted in the presence of the Engineer. The tests shall be repeated in the presence of local authorities having jurisdiction if required.

D. The Contractor shall furnish all labor, equipment, air, water and materials, including meters, gauges, blower, pumps, compressors, fuel, water, bulkheads, temporary weirs, valves, plugs and accessory equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. All pipelines and structures required to be watertight or airtight shall be tested for leakage. Piping and structures which fail the leakage test shall be repaired or replaced to the satisfaction of the Engineer and retested until leakage test results are acceptable.

B. Operation of Existing Facilities:

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.

C. Test gravity sewers and drain lines by an Infiltration Test as specified.

D. Test all other pipelines, with water under the specified pressures.

E. Leakage in pipelines of other than circular section shall not exceed an amount based on a circular section having an equivalent inner perimeter.

3.02 PRESSURE TESTS OF EXPOSED PIPING

A. Testing:

Pressure test exposed pipelines for leakage by the hydrostatic testing method only. The hydrostatic test shall be of at least 2-hour duration at the pressure rating for the pipe and joints as specified by the manufacturers. Examine all accessible joints during the test.

B. Test Pressures:

Test the various pipelines for leakage in accordance with the requirements for hydrostatic testing in AWWA or other applicable standards as specified in the Detailed Specifications or approved by the Engineer.

C. Leakage:

Stop all visible leakage.

3.03 PRESSURE TESTS OF BURIED OR CONCEALED PIPELINES

A. Testing:

1. Completely backfill all harnessed sections of buried piping before such sections are tested. Non-harnessed sections of buried piping shall be tested before backfilling.

2. Pressure test buried or concealed pipelines for leakage by maintaining the water pressure in the pipe at the specified pressure of the pipe for a minimum period of 4 hours.

3. 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.

   a. Do not use air for testing.

B. Test Pressures:

Test the pipelines at pressures specified in the Detailed Specifications or in accordance with standards approved by the Engineer.

C. Leakage:

Do not allow leakage for any piping, as determined by the above test, to exceed the testing allowance given by the following formula in AWWA Standard C600, Installation of Ductile-Iron Mains and Their Appurtenances:

$$L = \frac{SD\sqrt{\mathrm{P}}}{148{,}000}$$

Where:

L = testing allowance (makeup water), in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe, in inches

P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

3.04 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.

3.05 LEAKAGE TEST FOR GRAVITY SEWERS

A. Submerged Testing Procedure:

When the groundwater level is above the sewer, test sewers for infiltration as follows:

1. Measure the infiltrated flow of water by means of a weir set up in the invert of the sewer at a known distance from a temporary bulkhead or other limiting point of infiltration.

2. Test after the sewer or sewers have been pumped out, if necessary.

3. Do not start testing until normal infiltration conditions are established in the work to be tested.

    a. Inspect gravity sewer visually for infiltration.

    b. Pump the sewers dry and make sure the groundwater level is above the crown of the sewer.

    c. Inspect the sewer on the inside and seal all visible leaks completely.

B. Non-submerged Testing Procedure:

If the groundwater level is below the top of the sewer, test for leakage as follows:

1. Construct a bulkhead in the sewer at the manhole at the lower end of the section under test.

2. Fill the section being tested with water until the level of water is four feet above the crown of the sewer in the manhole at the upper end of the test section. For concrete sewers, allow the water to remain in the piping for at least 12 hours before conducting the tests.

3. Leakage will be the measured amount of water added to maintain the water at that level.

C. Carry on tests for a minimum of eight hours with readings at 60 minute intervals.

D. In computing the length of sewer contributing infiltration or leakage, include the length of house connections tested, if any, in the total length.

E. The leakage exfiltration or infiltration for sewers shall not exceed 100 gallons per inch of diameter per mile per 24 hours for any section of the sewer system. The exfiltration or infiltration test shall be performed with a minimum positive head of 24 inches.

F. Repair:

1. When the measured infiltration or leakage exceeds the specified amount, locate and repair defective manholes, pipe or pipe joints. If the defective portions cannot be located, remove and reconstruct as much of the original work as necessary to obtain a sewer within the allowable infiltration limits upon such retesting as necessary.

2. Regardless of the amount of infiltration or leakage measured, repair and seal in an approved manner all visible or detectable leaks in the sewers, manholes, structures, and other appurtenances.

3.06 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 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 additional cost to the City.

CONTRACT GI-CONS-7
SECTION 33 01 12.11
LEAKAGE DETECTION

3.07 LEAKAGE TESTS FOR CONCRETE STRUCTURES

A. Leakage tests of wet wells, tanks, channels, containment areas, and other water retaining structures shall be performed following the requirements of ACI 350.1and as specified herein. The Contractor shall supply all materials and labor needed to conduct the test as directed by the Engineer.

B. Prior to start of leakage testing, the following requirements shall be met.

1. All elements of the structure which resist any portion of the retained liquid pressure shall be in place and at specified strength levels. All concrete shall be fully cured.

2. Structure walls shall not be backfilled prior to leakage testing.

3. All valves, gates, blind flanges, and other non-concrete items which control the flow or otherwise retain the liquid contents of the structure, shall be checked for watertightness. If not watertight, means shall be taken to assure watertightness during the period of the leakage test.

4. The portions of the structure to be tested shall be cleaned of all construction debris, standing water, soil, foreign materials and any other material which interferes with the exposed concrete surfaces of the structure.

5. Defective concrete shall be repaired.

6. The Contractor shall notify the Engineer a minimum of 24 hours prior to start of filling of structure for leakage testing. Leakage testing shall not start until the structure is inspected by the Engineer.

C. Filling the Structure with Water

1. The portion of the structure to be tested shall be filled at a rate not to exceed two feet per hour.

2. The structure shall be filled to the normal operating depth of the structure as indicated on the Contract Drawings. Where no operating depth is indicated or where operating depth is controlled by flowing over a weir, the structure shall be filled to a depth 6 inches below the weir or top of wall elevation whichever is lower.

3. Water in the structure shall be maintained at the specified test elevation for a minimum of three days prior to the start of the leakage test.

D. After water has been brought to the test elevation, the exposed elements of the structure shall be inspected for leakage. All locations which exhibit any amount of leakage flow shall be repaired prior to the start of leakage testing.

E. The leakage test duration shall be determined by the Engineer based on ACI 350.1but shall not be less than 3 days.

F. Leakage Allowance

1. For unlined concrete structures, the maximum allowable leakage rate shall be 0.075 percent of the volume per 24-hour period.

2. For concrete structures with walls lined by a waterproof material, the maximum allowable leakage rate shall be 0.050 percent of the volume per 24-hour period.

G. Test Locations

1. Structure cells which are less than 1000 square feet in area shall have measurements of water level taken at two locations which are located approximately 180 degrees apart.

2. Structure cells which are greater than 1000 square feet in area shall have measurements of water level taken at four locations which are located approximately 90 degrees apart.

3. Each test location shall be marked and given a reference number. A reference point shall be marked on the face of the wall above the test water surface in a manner which will prevent its movement or deterioration during the period of the test.

4. Test locations must be approved by the Engineer.

H. Evaporation and Precipitation Measuring

1. In open structures, a clear plastic calibrated open-top container not less than 18 inches in diameter and depth shall be partially filled, floated in the tank, and held in position near each measurement location.

2. The container shall be located so as not to be shaded by tank walls and away from any items passing over it such as beams or pipes.

I. Test Measurements

1. Leakage tests shall not be started when periods of severe weather conditions or major changes in average daily temperature are predicted.

2. The following measurements shall be recorded at each test location at the start of the test period and at 24-hour intervals thereafter:

a. Distance from reference point to test water surface

b. Depth of water in the floating container

c. Temperature of the test water at 18 inches below water surface

d. Temperature of the water in the evaporation-precipitation container at mid-depth

J. Leakage Determination

1. The change in water surface elevation at each test location shall be averaged and adjusted as follows.

2. The total change in test water surface elevation shall be adjusted by the average change in water surface elevation in the evaporation-precipitation containers.

3. Where averaged water temperature measurements vary by more than 3 degrees from start to completion of the test period, adjustment in tank volume shall be determined by change of water density resulting from the change in the average water temperature.

K. Retesting

1. The leakage test shall be considered as failed if the specified leakage allowance is exceeded or if any leakage is observed.

2. If the test becomes unreliable due to excessive precipitation or other external factors, it shall be restarted.

3. If a leakage test fails, it may be retested immediately without repairs if approved by the Engineer. If subsequent leakage tests fail, the Contractor shall repair all probable areas of leakage and the leakage test shall be repeated. The structure shall be retested until it meets the specified leakage criteria. Repairs shall be made to the probable leakage areas before each retest.

3.08 LEAKAGE TESTS FOR NON-CONCRETE STRUCTURES

A. Steel, poly and fiberglass-reinforced plastic tanks and similar structures shall be tested for leakage by bulkheading the openings and filling the structure with water to 6 inches below the overflow water level. The tank shall be kept full until the water temperature has stabilized, but not less than 24 hours before the start of the leakage test. The leakage test shall consist of measuring the water surface elevation from a fixed point on the tank at two locations 180 degrees apart. Measurements shall be taken at the start of the test and 24 hours later.

B. Testing shall be performed before the installation of mechanical equipment and before applying any waterproofing coatings to the outside surfaces.

C. The exterior surface of the structure shall be inspected for leakage, especially in areas around joints.

D. Where environmental conditions could lead to changes in water level due to evaporation or precipitation, measurement of these factors shall be made as specified for testing concrete structures.

E. The leakage test shall be considered failed if there is any measurable drop in the water surface (after adjusting for evaporation and precipitation) during the 24-hour test period or if there is any visible leakage.

F. If visible leaks appear or if leakage exceeds the allowable limit, the structure shall be repaired by removing and replacing the leaking portions of the structure, waterproofing the inside, or by other approved methods. After repairs are complete, the test shall be repeated.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 01 30.41
CLEANING OF SEWERS AND MANHOLES

PART 1. GENERAL

1.01 REQUIREMENTS

A. The Contractor shall only clean existing storm sewer pipes, sewer manholes and other related appurtenances that directly convey stormwater runoff to and from (for overflow) green infrastructure practices, of all rubbish, dirt, debris, and any other materials if there is reason to believe that cleaning is required, in accordance with the plans, Specifications, and at the directions of the Engineer.

B. Manholes and related appurtenances shall be cleaned to the sump bottom in accordance with the Specifications and at the directions of the Engineer.

C. The Contractor shall CCTV existing storm sewer pipes that directly convey stormwater runoff to and from green infrastructure practices, as directed and if there is reason to believe that blockages exist that would directly impact the function of the green infrastructure practice, in accordance with the plans, Specifications, and at the directions of the Engineer.

D. All deposits generated by the Contractor's operations shall be removed from the site and disposed of. Under no condition shall deposits be removed from the sewer or appurtenances and placed on the ground, swale, road or other open environment-pending disposal. Deposits shall be kept in trucks or suitable containers pending removal from the site. All deposits removed during the workday shall be removed from the site by the end of that day. All trucks and containers shall be watertight if used to transport removed deposits over streets.

E. All material removed from the sewers under this Contract shall be properly disposed of in a designated landfill for this purpose in accordance with federal, State and local laws.

F. It shall be the Contractor’s responsibility to obtain all permits needed to do the Work.

G. The Contractor is responsible for any damage to existing structure caused by his operations and shall make repairs at no cost to the City.

H. INITIAL CLEANING:

The initial work hereunder shall be performed during the early stages of construction, as directed by the Engineer, and prior to the construction of new pavements, curbs, etc., thereby eliminating the necessity to remove and patch new construction that may be required due to the discovery and subsequent repair of damaged, collapsed, or restricted pipes.

I If directed by Engineer, the Contractor shall reconstruct existing sewers by the installation of a resin-impregnated flexible tube that is inflated within the existing conduit to form a hard, impermeable, corrosion resistant pipe within a pipe. When cured, the cured-in-place-pipe (CIPP) will be formed to the original conduit.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures.

1.03 PAYMENT

A. The measure of payment for CURED-IN-PLACE LATERAL LINING shall be the unit price bid per LINEAR FEET of each size sewer reconstructed by a CIPP DEP approved lining method and shall cover the cost of all labor, materials, plant, equipment, samples, tests, and insurance required or necessary to reconstruct the sewers of the sizes shown including the cleaning of the existing sewers using conventional non-excavation type pipe cleaning equipment; television inspection prior to installation; diversion of flow of existing sewers; controlling (or maintaining) the flow for all active service connections; necessary bypassing and pumping of the existing active service connections; repair of active service connections; all necessary excavation, backfilling and compaction; complete installation of the liner; preliminary television inspection of installed liner; temporary and permanent restoration of all disturbed sidewalk and pavement areas (unless items for temporary and permanent restoration are otherwise provided in the Bid Schedule); cleaning up; and furnishing and installing all other items necessary to complete this work and do all work incidental thereto, all in accordance with the plans and Specifications and as directed by the Engineer.

B. The price bid for CLEANING STORM PIPE shall be the number of LINEAR FEET of pipe cleaned, in accordance with the plans, Specifications, and directions of the Engineer.

C. The price bid for CLEANING STORM WATER DRAINAGE STRUCTURES shall be for EACH structure cleaned, in accordance with the plans, Specifications and directions of the Engineer.

D. The cost of maintaining and cleaning storm sewer piping and drainage structures during and upon completion of the Work will be deemed included in the unit prices bid for these items.

E. Payment for CCTV Inspection specified in this Section shall be made under Allowance Item A-2 CCTV Inspection.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

CONTRACT GI-CONS-7
SECTION 33 01 30.41
CLEANING OF SEWERS AND MANHOLES

1.05 REGULATORY COMPLIANCE

A. Qualifications & Experience review submittal:

1. List of all currently owned, equipment necessary to perform Work under this Contract including, but not limited to, service vehicles, vactor trucks, CCTV equipment, inventory of jet cleaning nozzles, testing equipment, tools, etc.

2. All applicable licenses, permits, and certificates, that are required to perform the Work under this Contract including, but not limited to, PACP certification, OSHA training certificates, and all permits required by the Contract documents.

3. Contractor is expected to follow all EH&S requirements as per Section 01 35 27 - Environmental, Health And Safety Requirements.

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

1.08 DEFINITIONS

A. **Clean** - all services required to remove the deposits from the sewer, including, but not limited to shoveling, handling, picking, raking, loading, and placing in trucks, transporting to approved dump site and there unloading, discharging and disposing of same according to the requirements of this Contract.

B. **Deposits** - sediment, silt, refuse, roots, timber, grease, rocks and materials of all kinds located within the sewers and appurtenances.

C. **Sewer Cleaned** – The sewer is considered “cleaned” when the Contractor’s work on this sewer is confirmed by supervision or proper documentation and the following criteria is met:

1. All the internal surfaces of the pipe free from deposits that can be clearly observed during the CCTV inspection.

PART 2. PRODUCTS

2.01 MATERIALS

A. Cured-In-Place Pipe Lining shall conform to NYC DEP Standard Sewer and Water Main Specifications Section 50.71 Reconstruction of Existing Sewers Using D.E.P. Approved Cured-In-Place-Pipe (CIPP) Lining Method.

PART 3. EXECUTION

3.01 STORM SEWER CLEANING

A. All pipes shall be cleared of debris by "Roto-Rooter”-type method or other methods, pending prior approval of the Engineer. All larger objects and other material that cannot be flushed out shall be removed by other methods. Clearing shall be considered satisfactory when not more than one-half inch of sediment or caked material remains on any part of the structure or pipe. The Contractor may find it necessary to use dyes or other methods, to determine the rate and direction of flow in the drainage system.

B. Where damaged, collapsed or restricted pipes are found during the initial investigation and clearing, they shall be repaired at the direction of the Engineer in accordance with the requirements of piping and excavation items in the Contract.

C. After the storm piping has been cleaned to the satisfaction of the Engineer, it shall be maintained in satisfactory operating condition, until final acceptance and completion of all work under this Contract.

D. Final Inspection:

Prior to, or as part of the final inspection with DEP, the Contractor, in the presence of the Engineer, shall conduct such inspections and tests as are necessary to determine that the storm drain sewer facilities are in clear and functional condition, as that achieved upon completion of the initial clearing. It shall be the Contractor's responsibility to perform such additional clearing as necessary to achieve such conditions at their own expense, at no additional cost to the City.

3.02 CCTV INSPECTION

A. General Procedures (including Equipment)

1. Television inspection equipment shall have an accurate footage counter that will display on the monitor and record the camera distance from the centerline of the starting entry point.

2. The camera shall be of the remotely operated pan and tilt type. The rotating camera and light head configuration shall have the capability of panning 360° with pan and tilt capability of providing a full view of the pipe to ensure complete inspection.

3. The camera, television monitor, and other components shall be color. To ensure peak picture quality throughout all conditions encountered, the color camera shall be equipped with the necessary circuitry to allow for the remote adjustment of the optical focus iris from the power control unit at the viewing station. A variable intensity control of the camera lights shall also be located at the viewing station.

4. Lighting and camera quality shall be suitable to allow a clear, in-focus picture for the entire inside periphery of pipelines extending at least ten (10) feet in front of the camera. In High Density Polyethylene (HDPE) or ductile iron poly-linedpipe, lighting should be sufficient to provide a clear view at least two (2) feet in front of the camera. The replay of the recorded video information shall be free of electrical interference and shall provide a clear stable image.

5. The travel speed of the camera shall be variable but uniform and shall not exceed 30 feet per minute. Any means of propelling the camera through the sewer line which would produce non-uniform or jerky movement of the camera, will not be acceptable.

B. Deliverables

1. Contractor shall record inspection in a PACP (Pipeline Assessment Certification Program) format and the video shall be recorded in an extra-high quality MP4 format, using H.265 (HEVC) compression. The title block shall include the following information:

   a. Date

   b. Television operator's identification (Name, ID number, etc.)

   c. Sewer segment number. Segment numbers shall be assigned by the Engineer

   d. Upstream manhole number

   e. Downstream manhole number

   f. Size of sewer pipe

   g. Pipe material and lining method

   h. Direction of movement of camera and direction of normal flow

   i. Location of service connections indicated by clock position and with counter distance in feet from beginning manhole's centerline.

   j. Location (start and end counter distances in feet from the beginning manhole's centerline) and description of obstructions, structural defects, longitudinal and/or circumferential cracking, joints including open and/or offset joints, ovality, leakage or evidence thereof, break in connections, protruding connections, mineral deposits, roots, previous repairs, deposits on pipe walls, sags, and other abnormalities with respect to the sewer's condition with counter distance in feet from the beginning manhole's centerline. Contractor shall use PACP standardized defect codes.

2. Video shall visually display, at a minimum, CCTV Contractor's name, project name, date of inspection, pipe segment number, manhole numbers or lateral lot numbers. The distance between manholes shall be verified by measuring tape. If the counter distance and the taping distance differ by more than 2 feet per 100 feet, the run shall be re-televised by CCTV Contractor.

3. Photographs

   a. Digital photographs in JPEG format shall be made of all recorded blocked observations.

   b. JPEG images shall be captured at a minimum resolution of 640x480 pixels.

   c. A minimum of TWO photographs of each defect shall be taken, one with a perspective view and one with a close-up view.

C. Final Report

1. Report summarizing findings of CCTV inspection shall be submitted to the Engineer.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 01 30.81
UTILITY STRUCTURE REHABILITATION

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Item, the Contractor shall rebuild utility structures including removing the frame and grates (and curb piece if applicable) and reconstructing the existing structure, including providing new frame and grate and setting the new frame to grade as shown on the plans, all in accordance with the plans, Specifications, and directions of the Engineer.

B. Under this item the Contractor shall remove existing frames and covers of utility structures (i.e. existing catch basins, manholes, drain inlets and electric covers) and reset them to grades shown on the plan or otherwise directed by the Engineer. Work under this item includes excavation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03 30 00 – Cast-in-Place Concrete

B. Section 04 05 00 – Common Work Results for Masonry

C. Section 31 23 16 - Excavation

D. Section 31 35 10 – Embankment and Channel Protection

E. Section 32 01 13.62 – Asphalt Surface Treatment

F. Section 33 01 30.41 – Cleaning of Sewers and Manholes

G. Section 33 39 10 – Sanitary and Storm Sewer Structures

1.03 PAYMENT

A. The price bid to RECONSTRUCT MANHOLE OR DRAINAGE STRUCTURE shall be a unit price for EACH, regardless of size, and shall include the cost of all labor, materials, and equipment, including new frame and grate or cover, brick masonry, concrete, grout, and any other incidental expenses necessary to complete the Work in accordance with the plans and Specifications, to the satisfaction of the Engineer.

B. The price bid to ADJUST TOP OF UTILITY STRUCTURE TO GRADE shall be a unit price for EACH and shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the Work in accordance with the plans and Specifications to the satisfaction of the Engineer.

C. The price bid to CORE DRILL MANHOLE OR DRAINAGE STRUCTURE shall be a unit price for EACH and shall include the cost of all labor, materials, equipment and

incidental expenses necessary to complete the Work in accordance with the plans and Specifications to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS (NOT USED)

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 CONCRETE

Concrete shall be mixed in the proportions of one (1) part Portland Cement, two (2) parts fine aggregate and four (4) parts coarse aggregate, with the maximum size of stone to be one inch (1"). Concrete shall meet requirements found in Section 03 30 00 – Cast-in-Place Concrete.

2.02 MORTAR

Mortar shall be composed of one (1) part Portland Cement and a maximum of two (2) parts sand, with not more than five percent (5%) of the cement content containing hydrated lime.

2.03 REINFORCEMENT

Reinforcement and dowels where required shall be deformed steel bars. Reinforcement materials and methods of installation shall conform to specification requirements Section 03 30 00 – Cast-in-Place Concrete.

2.04 BRICK MASONRY

A. Shall meet those requirements stated under the Item, Section 04 05 00 – Common Work Results for Masonry.

2.05 HOODS

A. Hoods shall be of the type existing and shall be installed with wall plates.

2.06 FRAMES, GRATE & COVERS

A. Shall meet those requirements stated under the Item, Section 33 39 10 – Sanitary and Storm Sewer Structures for each type of drainage structure for locations shown on Contract Drawings.

2.07 INCIDENTAL WORK

A. The Contractor shall furnish materials for and do all incidental work to complete the reconstruction of drainage structures, including setting and adjusting frames and plastering.

PART 3 EXECUTION

3.01 RECONSTRUCTION

A. The Contractor shall debride and purge all existing drainage structures of all rubbish, dirt, debris, and any other materials to the original depth of the basin, prior to reconstructing the drainage structures. Such method of cleaning existing structures and related piping shall be paid for under the Item 33 01 30.41 Cleaning of Sewers and Manholes

B. All excess materials, dirt, and debris generated by the Contractor's operations shall be removed from the site and disposed of at the Contractor’s expense. The existing frame, grate, and curb piece shall also be discarded or become the property of the Contractor.

C. The existing drainage structure shall then be reconstructed in strict accordance with the DPR Standard Details and DEP Bureau of Water and Sewer Operations Sewer Design Standard Details. After the drainage structures have been reconstructed, they shall be maintained in satisfactory operating condition, until final acceptance and completion of all Work under this Contract. Prior to, or as part of the final inspection, the Contractor, in the presence of the Engineer, shall conduct such inspections and tests as are necessary to determine that the drainage facilities are in clear and functional condition. Such condition being defined as equal to that achieved upon completion of the initial clearing and it shall be the Contractor's responsibility to perform such additional clearing as is necessary to achieve such conditions, at their own expense and at no additional cost to the City.

D. The Contractor is responsible for any damage caused to existing structures by their operations and shall make repairs with no additional cost to the City.

3.02 ADJUST UTILITY STRUCTURE TO GRADE

A. All changes shall be made with acceptable brick laid in Portland cement mortar of one (1) part cement and two (2) parts of fine aggregate. Materials shall meet requirements in Section 04 05 00 – Common Work Results for Masonry, Section 03 30 00 – Cast-in-Place Concrete, and Section 31 05 16 – Aggregates for Earthwork.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 05 05.33
DOUBLE RING INFILTROMETER TESTING

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this Item, the Contractor shall perform preliminary infiltration testing at the finished excavation depth at each of the proposed Green Infrastructure practice locations as shown and in accordance with the Contract Documents, and directions of the Engineer.

B. Under this Item, the Contractor shall perform final acceptance infiltration testing at the finished grade of bioretention at each of the proposed Green Infrastructure practice locations as shown and in accordance with the Contract Documents, and directions of the Engineer.

C. All applicable Occupational Safety and Health Administration (OSHA) regulations related to earthwork and excavation is required.

D. Contractor shall notify DEP and Engineer of all scheduled infiltration tests. All infiltration tests shall be supervised by Engineer. If test results exceed 10 inches per hour or greater, Contractor shall notify DEP and Engineer immediately.

E. Where infiltration testing is to be performed (as directed by the Engineer), the measured infiltration rate of the underlying soil must be determined using the IN2-W-Turf-Tec Infiltrometer (6 cm x10.79 cm x 18 cm) or approved equal (as further described in Article 3.01).

Preliminary infiltration testing shall include, two (2) infiltration tests at each Green Infrastructure location for Green Infrastructure footprints ≤ 500 square feet and four (4) for GI footprints >501 square feet shall be performed.

Final acceptance testing (for bioretention systems only) shall include, two (2) infiltration tests at each Green Infrastructure location for Green Infrastructure footprints ≤ 500 square feet and four (4) for GI footprints >501 square feet.

F. A report, prepared by a registered civil engineer, geotechnical engineer, certified engineering geologist or certified hydrogeologist shall be provided to the Engineer.

G. The results of the preliminary permeability testing may impact the outlet control structure. For Sites with permeability of five inches per hour or greater, DEP may eliminate the outlet control structure at no cost to the City. For Sites with permeability of two to five inches per hour the DEP may require the orifice to be capped. The Contractor shall include the date of infiltration testing on the Construction Progress Schedule.

H. Tests may be performed only by individuals trained to perform, understand and evaluate the field conditions. The individual(s) supervising the fieldwork must be named in the final report as described in Paragraph 1.01 C.

I. All bioretention Green Infrastructure practices require final acceptance infiltration testing by the Contractor. The Contractor shall be responsible for communication with the Engineer and DEP in advance of scheduled final acceptance infiltration testing.

A test fails if the field infiltration rate is materially less than the chemical and physical properties of the rain garden soil submittal, previously approved by the Engineer.

If a test fails, a portion or the entire Green Infrastructure practice shall be repaired / replaced as directed by the Engineer and DEP and retested at no additional cost to DEP.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 23 16 – Excavation

B. Section 01 33 00 – Submittal Procedures

C. Section 01 32 16 – Construction Progress Schedule

1.03 PAYMENT

A. The price bid shall be a unit price per EACH DOUBLE RING INFILTROMETER TEST performed and shall include the cost of all labor, materials, and equipment necessary to complete the testing in accordance with the plans and Specifications, and to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM D3385 Double Ring Infiltrometer Testing.

B. https://www.forestry-suppliers.com/Search.php?stext=Turf-Tec

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit list of equipment and qualifications of personnel performing infiltration testing as specified in Section 01 33 00 – Submittal Procedures.

1.07 QUALITY CONTROL (NOT USED)

CONTRACT GI-CONS-7
SECTION 33 05 05.33
DOUBLE RING INFILTROMETER TESTING

PART 2 PRODUCTS

2.01 GENERAL

A. Preliminary Infiltration Testing: Two (2) infiltration tests at each Green Infrastructure practice location for Green Infrastructure footprints ≤ 500 square feet and four (4) for Green Infrastructure footprints >500 square feet shall be performed.

B. Final Acceptance Infiltration Testing: Two (2) infiltration tests at each Green Infrastructure practice location for Green Infrastructure footprints ≤ 500 square feet and four (4) for Green Infrastructure footprints >500 square feet shall be performed.

C. The most reliable test method for measuring infiltration is called a saturated test. This method is performed by placing the Infiltrometer directly into the soil to be tested and filling the rings 3 times, allowing the water to infiltrate into the soil between fillings. Once the soil is saturated, the test can be performed.

D. A visual indication of soil moisture should also be noted by using a Soil Profile Sampler.

2.02 MATERIALS

A. The infiltration rate of the excavated Green Infrastructure practice soil shall be determined using the IN2-W-Turf-Tec Infiltrometer (6 cm x10.79 cm x 18 cm) or approved equal (as described in Section 3.01).

B. Equipment needed:

- 1 mini-water level indicator
- 4 Turf-Tec infiltrometers
- 1 stop watch (in case of malfunctioning infiltrometer timer)
- 1 Aquaterr M350 Digital Soil Moisture Meter or approved equal
- 1 level
- Thermometer
- Data sheet

CONTRACT GI-CONS-7
SECTION 33 05 05.33
DOUBLE RING INFILTROMETER TESTING

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS FOR DOUBLE RING INFILTROMETER TESTING

A. In coordination with the Engineer, the Contractor shall identify the locations where each infiltrometer is going to be placed.

B. Record the locations of the infiltrometers on the Data Log Diagram and take photos.

C. Remove small obstacles such as stones or twigs.

D. Push down on the handle grips while slightly turning instrument back and forth until the Satum ring (depth limiting ring) is against the soil surface (approximately 2", see Figure 1). Use a level to ensure each infiltrometer is leveled. Silicone spray may be applied to the cutter edges to allow easier and cleaner removal of tool.

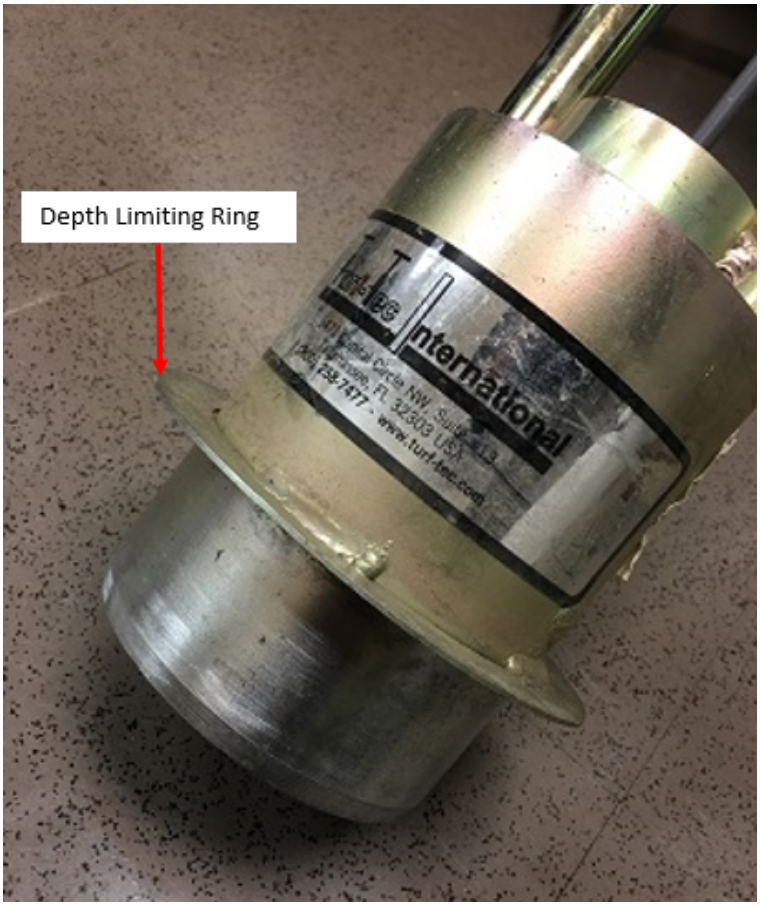


Figure 1. Infiltrometer Depth

E. Pre-soaking

Note: the following steps should take place concurrently at all infiltration locations within the Green Infrastructure footprint.

1. Prior to soaking the soil, place the probe of the digital soil moisture meter into the soil from the space between the inner ring and outer ring of the infiltrometer (see photo below). Obtain and record the reading (Run 0) on the Data Log sheet.



2. Measure temperature of water and record on Data Log sheet.

3. Set the infiltrometer timer to 10 minutes.

4. Fill up both inner and outer rings with water until they slightly overflow (start by filling inner first and allowing spilling over into outer ring).

5. When the timer runs out, insert the probe of the digital soil moisture meter into the soil from the space between inner ring and outer ring of the infiltrometer. Obtain and record the reading in the Data Log sheet.

6. Repeat steps 2 to 5 two more times, so there are a minimum of three data points at each infiltrometer location. Pre-soaking is considered to be completed if the differences between two consecutive readings collected are both within 2% of each other. If not, repeat steps 2 to 5 until the criteria are met. Pre-soaking is also considered to be completed after 1 hour of soaking test (which equals to 6 rounds of steps 2 to 4).

F. Infiltration Test

Note: the following steps should take place concurrently at all infiltration locations within Green Infrastructure footprint.

1. Take the temperature of the water and record it on the Data Log sheet.

2. Press the Stop/Reset Button once to reset the timer to read "00 00". Set the infiltrometer timers from to 15 minutes.

3. Fill up both inner and outer rings with water until they slightly overflow (start by filling inner first and allowing spilling over into outer ring).

4. When the pointer reaches the beginning of the inch scale, start the timer immediately by pressing start button.

5. As the water seeps into the soil, the plastic ball attached to the tube will measure the water in inches and register it on the scale with the pointer located just below the timer.

6. Record the infiltration rate from the infiltrometer scale when the timer runs out or when the plastic floating ball sinks to the bottom (you could push the scale slightly down from the top to check whether there is still water supporting the suspension of the plastic floating ball), whichever comes first. If the water drops to the bottom before the timer runs out, also record the time when that happens. See Figure 4 for detailed demonstration.

7. If the infiltration rate is slow, a thirty-minute or an hour-long test will be required.



Figure 4: Confirming if infiltration is completed)

8. Repeat step 1 to 7 for three more rounds. Alternatively, set up the 4 Turf-Tec infiltrometers at the same time and run the test simultaneously (where applicable).

3.02 DATA LOG: Construction Double Ring Infiltrometer Pre-Soak Testing

Project Name: _____ **Date:** _____
Project Address: _____ **Weather:** _____
Field Crew Members: _____

GI Unique ID: _____

Pre-Soaking

Start Time: _____

End Time: _____

Run	Time (min)	Soil Moisture Reading at Each Location			
		1	2	3	4
0 (pre-soak reading)	0				
1	10				
2	10				
3	10				
4 (if necessary)	10				
5 (if necessary)	10				
6 (if necessary)	10				

CONTRACT GI-CONS-7

SECTION 33 05 05.33

DOUBLE RING INFILTROMETER TESTING

DATA LOG: Construction Double Ring Infiltrometer Testing

Soil Infiltration Testing (4" Turf-Tech Infiltrometer):

Infiltration Test Location: **1** *[Indicate on diagram]*
Water Temperature (ºC) _____
Test begin time: _____
Pre-soak time: _____
Soil moisture reading (3 inches): _____ *[% volumetric water content]*
Test end time: _____

Run	Time (mins)	Reading (inches)	Rate Calculated (inches/hr)
1	0		
	15*		
2	0		
	15*		
3	0		
	15*		

Stabilized Infiltration Rate (inches/hr): _____

*If water drops to bottom before timer is up, enter the time at which this occurs.

Infiltration Test Location: **2** *[Indicate on diagram]*
Water Temperature (ºC) _____
Test begin time: _____
Pre-soak time: _____
Soil moisture reading (3 inches): _____ *[% volumetric water content]*
Test end time: _____

Run	Time (mins)	Reading (inches)	Rate Calculated (inches/hr)
1	0		
	15*		
2	0		
	15*		
3	0		
	15*		

Stabilized Infiltration Rate (inches/hr): _____

*If water drops to bottom before timer is up, enter the time at which this occurs.

Infiltration Test Location: **3** *[Indicate on diagram]*
Water Temperature (ºC) _____
Test begin time: _____
Pre-soak time: _____
Soil moisture reading (3 inches): _____ *[% volumetric water content]*

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SECTION 33 05 05.33
DOUBLE RING INFILTROMETER TESTING

Test end time: _____

Run	Time (mins)	Reading (inches)	Rate Calculated (inches/hr)
1	0		
	15*		
2	0		
	15*		
3	0		
	15*		

Stabilized Infiltration Rate (inches/hr): _____

*If water drops to bottom before timer is up, enter the time at which this occurs.

Infiltration Test Location: **4** *[Indicate on diagram]*
Water Temperature (ºC) _____
Test begin time: _____
Pre-soak time: _____
Soil moisture reading (3 inches): _____ *[% volumetric water content]*
Test end time: _____

Run	Time (mins)	Reading (inches)	Rate Calculated (inches/hr)
1	0		
	15*		
2	0		
	15*		
3	0		
	15*		

Stabilized Infiltration Rate (inches/hr): _____

*If water drops to bottom before timer is up, enter the time at which this occurs.

3.03 DIAGRAM

Indicate on diagram the following information:

- Dimensioned Green Infrastructure footprint
- North arrow
- Location of each infiltrometer test (include dimensions of Green Infrastructure footprint)
- Name of park
- Streets
- Depth of excavation

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 05 09.13
COUPLINGS FOR UTILITY PIPING

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide sleeve-type and groove-and-shoulder-type couplings in pipelines as shown, specified and required.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 23 16 - Excavation

B. Section 33 42 11 - Stormwater Gravity Piping

C. Section 22 10 00 - Plumbing Piping

D. Section 33 05 19 - Ductile Iron Utility Piping

1.03 PAYMENT

A. There will be no separate payment for the Work specified herein. The costs shall be considered incidental to the Work and included in the prices bid for the various Contract items.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. ASTM International:

1. A47 Ferritic Malleable Iron Castings.

2. A193/A193M Alloy-Steel and Stainless-Steel Bolting Materials for High-Temperature Service.

3. A194/A194M Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.

4. A276 Stainless and Heat-Resisting Steel Bars and Shapes.

5. A283/A283M Low and Intermediate Tensile Strength Carbon Steel Plates.

6. A536 Ductile Iron Castings

7. A744 Corrosion-Resistant Iron-Chromium-Nickel and Nickel-Base Alloy Castings for Severe Service.

8. B26 Aluminum-Alloy Sand Castings.

9. D2000 Classification System for Rubber Products in Automotive Applications.

B. The American Society of Mechanical Engineers (ASME):

1. B1.1 Unified Inch Screw Threads (UN and UNR Thread Form).

2. B18.2.2 Fasteners in Customary Uses - Hex Nuts.

3. B31.1 Power Piping.

C. American Water Works Association (AWWA):

1. C606 Joints, Grooved and Shouldered Type.

2. Manual M11 Steel Pipe - A Guide for Design and Installation.

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Contractor shall submit Shop Drawings which shall include, but not be limited to:

1. Location in pipeline

2. Catalog data showing dimensions and materials of component parts

3. Harnessing, where required

4. Working and test pressures

B. Contractor shall forward process air piping layout drawings to the coupling manufacturer for review and design recommendations. The coupling manufacturer shall address as minimum the allowable angular pipe deflection, flexibility, contraction and expansion based on the maximum range of operating conditions.

1.07 QUALITY CONTROL (NOT USED)

1.08 DESIGN REQUIREMENTS

A. Pipe couplings for making field joints between plain end, grooved end, and shouldered end pipe and fittings shall meet the requirements of the Code on Power Piping, ASME B31.1.

B. Coupling design and construction shall facilitate easy assembly in the field.

C. Flexible couplings shall be designed and constructed to insure permanently tight joints under all conditions of expansion, contraction, shifting and settlement to which the

pipelines may be subjected as a result of the operation and layout of the process system in which they are installed.

D. Rigid couplings shall be designed and constructed to provide a tight joint and prevent pipe movement at the joint.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The following manufacturers are acceptable. Equivalent products from other manufacturers may be submitted for approval.

B. Sleeve-type Couplings:

1. Dresser Manufacturing Division Dresser Industries, Bradford, PA

a. For steel pipelines, Style 38.

For ductile iron pipelines:

1) 12" and smaller - Style 138.

2) Larger than 12" - Style 38.

For steel pipelines, Type 411.

For ductile iron pipelines:

1) 12" and smaller - Type 441.

2) Larger than 12" - Type 411.

To join different types and sizes of pipe, Type 441.

2. Smith-Blair Company, Texarkana, AR:

a. To join different types and sized of pipe, Style 162

3. Or approved equal

C. Groove- and Shoulder-type Couplings:

1. +Victaulic, Easton, PA:

For steel pipelines:

1) Grooved, flexible, Style 77.

2) Grooved, rigid, Style 07.

3) Shouldered, Style 44.

For ductile iron pipelines:

4) Grooved, flexible, Style 31 with flexible radius grooves.

5) Grooved, rigid, Style 31 with rigid radius grooves.

6) Shouldered, Style 31.

For stainless steel pipelines:

7) Grooved, flexible, Style 77S.

8) Grooved, rigid, Style 008.

For aluminum pipelines:

9) Grooved, flexible, Style 77A.

For copper pipelines:

10) Grooved, rigid, Style 606.

For PVC pipelines:

11) Grooved, flexible, Style 775.

For High Density Polyethylene (HDPE) pipelines:

12) Plain end, rigid, Style 995.

2. Or approved equal

D. Groove- and Shoulder-type Fittings as manufactured by:

1. Victaulic, Easton, PA for Full-Flow Fittings.

2. American Cast Iron Pipe Co., Birmingham, AL.

3. U.S. Pipe and Foundry Co., Bessemer, AL.

4. Or approved equal.

E. Bolted Split-Sleeve Type Couplings as manufactured by:

1. Victaulic, Easton, PA for Depend-O-Lok, Type 1 or 2.

2. Or approved equal.

2.02 COUPLINGS

A. Couplings shall be either one of the following three types:

1. Sleeve-type couplings shall be solid (axially un-split/unbolted) and have a middle ring or sleeve placed around the pipe joint. The middle ring shall be sealed by two wedge-shaped gaskets evenly compressed by follower flanges or rings tightened by bolts and nuts.

2. Groove- and shoulder-type couplings shall have a C-shaped (cross section) sealing gasket placed around the joint. The gasket shall be enclosed in a split-type housing which shall engage shoulders or grooves in the pipe. The housing shall be assembled by bolts and nuts.

3. Bolted split sleeve type couplings as detailed under Article 2.07.

2.03 BOLTS AND NUTS

A. Bolts for sleeve-type and groove- and shoulder-type couplings shall be Type 316 stainless steel, ASTM A 193/A 193M, Grade B8, Class 2. Nuts shall be Type 316 stainless steel conforming to ASTM A194/A194M. Bolts shall have American Screw Threads, Coarse Thread Series, ASME B1.1. Nuts shall be American Standard Heavy Dimension Series, ASME B18.2.2.

B. For all sleeve-type couplings, bolts shall be double radius head or buttonhead track type. The collars under the heads shall fit oval or square holes in the follower rings.\

C. For all groove-and shoulder-type couplings, bolts shall be track type oval neck bolts. The collars under the heads shall engage the oval slots in the housing.

2.04 SLEEVE-TYPE COUPLING

A. Sleeve-type couplings shall be of steel construction for steel pipe lines. Sleeve-type couplings for ductile iron pipelines shall be constructed of ductile iron or steel for pipe sizes 12 inch and smaller and shall be constructed of steel for pipes larger than 12 inch.

1. For Steel Pipe Lines:

a. The middle ring or sleeve and the follower rings or flanges shall be steel, ASTM A 283/A 283M (Grade A). The middle ring or sleeve shall have flared or beveled

ends. The follower rings or flanges and the middle ring or sleeve shall be true circular sections free from irregularities, flat spots or surface defects.

b. The middle ring or sleeve shall not have a center pipe stop, unless otherwise specified, and shall have the following minimum dimensions:

Pipe Diameter (inches)	Middle Ring Thickness (inches)	Middle Ring Length (inches)
8 and Smaller	1/4	5
10-30	3/8	7
Over 30	1/2	10

c. After welding, welded steel follower rings shall be sized and tested by cold expanding a minimum of one percent beyond the yield point.

B. For Ductile Iron Pipe Lines:

1. The middle ring or sleeve shall be ductile iron, ASTM A536. The middle ring or sleeve shall have flared or beveled ends. Follower rings or flanges shall be of ductile iron, ASTM A536, or malleable iron, ASTM A47 (Grade 32510), for pipe sizes 12 inches and smaller, and shall be of steel ASTM A283/A283M (Grade A) for pipe larger than 12 inches.

2. The middle ring shall not have a center pipe stop, unless otherwise specified, and shall have the same minimum dimensions as specified above for couplings for steel pipe.

C. Gaskets shall be resilient, wedge-shaped gaskets with a maximum angle of 40 degrees at the wedge end. Gasket material shall be compatible with the type and temperature of the fluid in the pipeline, and shall be the material recommended by the manufacturer for the service unless otherwise specified.

D. The maximum working pressure of the sleeve-type couplings shall not be less than 250 psi for pipe sizes smaller than 54 inch, and not be less than 200 psi for pipe larger than 54 inch.

2.05 GROOVE- AND SHOULDER-TYPE COUPLINGS

A. Couplings may be of the grooved type for steel pipe in sizes up to and including 24 inches. For steel pipe larger than 24 inches, suitable welded steel collars, Victaulic Vic-Ring Type C or Type E, or approved equal, shall be welded to the pipe ends. Unless otherwise specified, groove-type couplings shall conform to the requirements of AWWA C606.

B. Housing shall be in two or more parts, closely fitting the pipe and gasket. Housing material shall be ductile iron, ASTM A536 (Grade 654512), except for stainless steel and aluminum pipelines, which shall have housings of Type 316 stainless steel, ASTM A744 Grade CF-8M, and aluminum, ASTM B26, Alloy 356-T6, respectively.

C. Gaskets shall be of materials compatible with the type and temperature of the fluid in the pipeline, and shall be of the material as recommended by the coupling manufacturer for the service unless otherwise specified. Gaskets shall be molded so that internal pressure tightens the seal. All gaskets shall be continuous, uniform in texture, and free from surface blemishes and defects.

2.06 GROOVE- AND SHOULDER-TYPE FITTINGS

A. Grooved end fittings for steel and ductile iron pipe in sizes up to and including 24 inches shall be cast of ductile iron with working pressure ratings not less than the following:

Nominal Pipe Size (Inches)	Working Pressure (psi)
3/4" - 6"	1,000
8" - 12"	800
14" - 22"	300
24"	250

B. For steel and ductile iron pipe larger than 24 inches, fittings shall be provided with shoulders. Working pressure ratings shall not be less than 150 psi. Fabricated steel fittings shall be provided with extra-long end pieces to suit the coupling.

C. Grooved end fittings for stainless steel pipe shall be Type 304 of the thickness schedule specified in the Contract Documents.

D. Grooved end fittings for aluminum pipe in sizes 1 inch through 8 inches shall be of aluminum alloy 356 T6 conforming to ASTM B26, and shall be equal to Victaulic full-flow aluminum fittings. Working pressure ratings shall be not less than 500 psi for fittings in sizes 1 inch through 6 inches and not less than 400 psi for 8 inch size fittings.

E. Grooved end fittings for copper pipe shall be provided with rolled grooves and shall be designed for a working pressure not less than 300 psi.

2.07 BOLTED SPLIT-SLEEVE TYPE COUPLINGS

A. Couplings for large diameter steel piping shall be bolted, split-sleeve type consisting of four basic components: two-piece housing, gasket assembly, bolts and nuts with

restraining end rings as required for pipe restraint. The selected couplings shall be designed for the type, size and working pressure of the pipe with which they are to be used.

B. Coupling housing shall be manufactured from Type 316 stainless steel for stainless steel pipe and from carbon steel for carbon steel pipe.

C. The split-sleeve coupling shall be constructed with a double arch cross section which closes around either:

1. pipe section ends that have been smoothed for expansion or contraction, or

2. pipe section ends with steel end rings affixed for restraining purposes.

D. The coupling shall confine an elastomeric gasket beneath the sleeve arches to create a radial seal as the coupling closes.

E. Elastomeric gasket materials shall have properties as designated by ASTM D2000 suitable for air service up to 240°F with intermittent exposure to 280°F.

F. Gasket sealing members shall consist of two O-ring gaskets and an elastomeric sealing pad bonded to an integral sealing plate. Internal pressure shall not be a requirement for fully completing the sealing function.

G. Restraining rings shall be furnished with the couplings and shall be of the same material as the coupling housing.

1. Restraining rings for fixed type couplings shall be shop welded to the piping by the piping fabricator.

2. The restraining rings shall be forwarded to the piping fabricator for shop mounting and welding in place.

3. The coupling manufacturer's recommendation for size and amount of welding required for properly attaching the restraining rings shall be followed without exception.

H. When deflection is required at a pipe joint, a flexible coupling shall be provided. Flexible couplings shall be equal to Depend-O-Lok EXE Type 1 or Type 2. Type 2 couplings are Type 1 couplings with shoulders added to provide more angular deflection within the pipe joint.

1. Minimum deflection for Type 1 couplings shall be as follows:

Nominal Pipe Size, Inches	Minimum Deflection Degrees
8-14	4.50
16-24	4.00
30 & 36	3.00
42-54	2.00
60	1.75
66 & 72	1.50
84 & larger	1.00

2. Maximum deflection for Type 2 couplings shall be as recommended by the manufacturer.

3. Coupling width shall not be less than 10 inches for pipe sizes 8 inch through 84 inch, and not less than 12 inches for larger size pipe.

4. Minimum wall thickness of couplings shall be computed by the following formula:

$$t = \frac{Pd}{2s}$$

Where:

P = Design pressure in psi
d = Pipe O.D. in inches
s = 18,000 psi design stress

I. Bolts, nuts and miscellaneous hardware shall be furnished by the coupling manufacturer and shall be Type 316 stainless steel conforming to ASTM A276 and having a minimum tensile strength of 85,000 psi.

PART 3 EXECUTION

3.01 INSTALLATION

A. Ends of pipe, fittings and couplings shall be cleaned of all scale, dirt and thick outside coatings. Before assembly, the ends of pipe and/or fittings and the outside of the coupling gasket shall be lubricated as recommended by the manufacturer. Fasteners shall be

assembled using a thread lubricant equal to G-N paste (Molycote) as manufactured by Dow-Corning, Auburn MI, or approved equal.

B. Couplings shall be assembled by tightening diametrically opposite bolts evenly and progressively. Bolts on sleeve-type couplings shall not be tightened beyond the point of stretching (when the mill scale on the shank begins flaking off). Bolts on groove- and shoulder-type couplings shall be tightened only until there is metal to metal contact between housing segments and the pipe.

C. Field Assembly of Groove-type Couplings. Field grooving of pipe shall not be done unless approved by the Engineer, and then shall be limited to steel pipe 24 inches or under nominal diameter and to ductile and cast iron pipe 12 inches or under nominal diameter. Field grooving shall be done only with special tools provided by the coupling manufacturer.

D. Harness for Sleeve-type Couplings. In all pipelines under pressure, and elsewhere where shown, specified or required, sleeve-type couplings shall be harnessed.

1. On all pressurized steel pipe, cast steel "crow-foot" lugs shall be welded on diametrically opposite sides of the pipe, and the joint shall be harnessed with stainless steel tie-bolts and nuts. The dimensions, sizes, spacing and materials for lugs, tie-bolts and nuts shall be based on the use of a minimum of two bolts and four lugs per joint, in conformity with Section 13 (Table 13.4) of AWWA Manual M11 or the standard Specifications of the coupling manufacturer for the pipe size, wall thickness and test pressure specified. Welding shall conform to all applicable and most current ASTM standards.

2. On all pressurized ductile iron pipe, couplings shall be harnessed with stainless steel tie bolts and nuts connected to flanges or fittings installed on the pipe on each side of the coupling as shown, specified or required for the pipe sizes and specified test pressures. The harnessed length from flange to flange shall not exceed 3 feet.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 05 19
DUCTILE IRON UTILITY PIPING

PART 1 GENERAL REQUIREMENTS

A. Requirements for providing ductile iron pipe of various sizes, fittings and specials; and cast-iron soil pipe and fittings.

1. Ductile iron pipe and fittings shall be furnished and installed complete with all necessary jointing materials, wall castings, wall sleeves, specials, couplings, hangers, supports, anchors, adapters, identification signs, and other appurtenances as shown on the Contract Drawings and as required for a complete installation.

2. The Contractor shall provide all labor and materials for making connections to existing lines or lines installed under other contracts, including all specials required to connect pipe of dissimilar materials.

B. Ductile iron pipe shall conform to the American National Standards Institute (ANSI) and American Water Works Association (AWWA) Standards specified herein and recommendations as given in the Ductile Iron Pipe Research Association (DIPRA) "Handbook of Ductile Iron Pipe." Ductile iron pipe for City water shall conform to the rules and regulations of the Bureau of Water Supply; requirements contrary to such rules and regulations specified herein shall be disregarded.

C. All work related to BWSO water and sewer utilities will be inspected and approved by BWSO Construction Unit. All required documents listed in the BWSO Pre-Construction Checklist shall be submitted to BWSO Construction Unit prior to the pre-construction meeting.

D. New BWSO water lines shall be installed per DEP Standard Specifications for On-Site Green Infrastructure Section 33 05 19 Ductile Iron Utility Piping and NYC DEP Standard Sewer and Water Main Specifications Sections 60.11 Furnishing and Delivering Ductile Iron Pipe, Section 60.12 – Laying Ductile Iron Pipe and Fittings, and Section 60.13 Furnishing and Delivering Ductile Iron Fittings.

E. Ductile iron lines shall be installed with concrete cradles in accordance with NYC SEWER DESIGN STANDARDS DETAIL SE 1: STANDARD FOR VITRIFIED CLAY PIPE ON CONCRETE CRADLE ON EARTH OR ON ROCK.

F. Ductile iron lines shall be encased in concrete as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 33 01 12.11 – Leakage Detection

B. Section 03 30 00 – Cast-in- Place Concrete

C. Section 33 05 09.13 – Couplings for Utility Piping

D. Section 31 23 16 – Excavation

E. Section 31 35 10 – Embankment and Channel Protection

F. Section 22 10 00 – Plumbing Piping

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the Contract documents and shall include the cost of all labor, materials and equipment necessary to complete the Work, including delivering, handling and laying of pipe, connection and fittings and thrust blocks for water pipe, all in accordance with the plans and Specifications to the satisfaction of the Engineer. No direct payment will be made for painting, coating, lining, gaskets, harnesses, bolts, nuts and other appurtenances and material required to provide and assemble the lines; the cost thereof shall be included in the prices bid for ductile iron pipe.

B. The price bid shall be a unit price per LINEAR FOOT of laying length of 8 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

C. The price bid shall be a unit price per LINEAR FOOT of laying length of 10 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

D. The price bid shall be a unit price per LINEAR FOOT of laying length of 12 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

E. The price bid shall be a unit price per LINEAR FOOT of laying length of 16 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

F. The price bid shall be a unit price per LINEAR FOOT of laying length of 18 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

G. The price bid shall be a unit price per LINEAR FOOT of laying length of 20 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

H. The price bid shall be a unit price per LINEAR FOOT of laying length of 24 INCH DIAMETER OF DUCTILE IRON SEWER OR WATER PIPE as applicable of each size shown.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

B. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.

C. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids

D. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

E. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges

F. AWWA C150/ANSI A21.50 - Thickness Design of Ductile Iron Pipe

G. ANSI A21.11 - Ductile Iron Pipe Push on and Mechanical Joints

H. AWWA C151/ANSI A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water

I. AWWA C153 - Ductile-Iron Compact Fittings, 3 inches through 24 inches and 54 through 64 inches, for Water Service

J. AWWA C606 - Grooved and Shouldered Joints

K. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners

L. ASTM B98 - Copper Silicon Alloy Rod, Bar and Shapes

M. ASTM C283 - Resistance of Porcelain Enameled Utensils to Boiling Acid

N. DIPRA - Handbook of Ductile Iron Pipe

O. NY Spec 24-C-38 - Caulking

P. NYBC - New York City Building Code

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Contractor shall submit Shop Drawings for approval of the Engineer. Submittals shall include, but not limited to, the following:

1. Shop Drawings

2. Results of Certified Shop Tests.

3. Certified Letters of Compliance.

B. Shop Drawings shall include, but not be limited to:

1. Catalog data consisting of Specifications, illustrations and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.

2. Complete layout and installation drawings, including plans, sections and cross-sections showing elevations with clearly marked dimensions. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Scale and size of the drawings shall conform to the Contract Documents. Piping layout drawings shall indicate information on pipe supports, location, support type, hanger rod size, insert type and the load in pounds.

3. Details of pipe lining, coating, wrapping, insulation and painting of all pipe.

4. Weights of all component parts.

5. Tabulated pipe layout schedule shall include the following information for all pipe and fittings: service, pipe size, working pressure, joint type, wall thickness, piece number, and laying length.

6. Flexible couplings, with harness details if required.

C. Locations where pipe and valve identification signs will be placed.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Ductile iron pipe and fittings shall be as manufactured by the following:

1. American Cast Iron Pipe Co., Birmingham, AL

2. McWane Inc., Birmingham, AL

3. United States Pipe and Foundry Co.(U.S. Pipe), Birmingham, AL.

4. Or approved equal.

2.02 DUCTILE IRON PIPE AND FITTINGS

CONTRACT GI-CONS-7
SECTION 33 05 19
DUCTILE IRON UTILITY PIPING

A. Pipe shall be in accordance with AWWA C151 for push-on or mechanical joint for water pipe , ANSI A21.11 for push-on or mechanical joint for sewer pipe and AWWA C115 for flanged pipe and shall be of grade 60 42 10 ductile iron. The above standards cover ductile iron pipe with nominal pipe sizes from three inches up to and including sixty-four inches in diameter. Working pressure for the pipe shall be as called for in these Standards.

B. Pipe

1. All pipe, including flanged pipe, for sizes up to and including twelve inches shall have a wall thickness equal to Special Thickness Class 56 as specified in AWWA C151.

2. All pipe, including flanged pipe, for sizes over twelve inches and up to fifty-four inches shall have a wall thickness equal to Special Thickness Class 54 as specified in AWWA C151.

C. Fittings

1. Fittings shall be ductile iron and shall be in accordance with AWWA C110. Any other fittings, not included in AWWA C110, shall conform in design and performance to the requirements of this Standard.

2. Blind, filler, companion and reducing flanges shall conform to ANSI/ASME B16.1.

3. Where compact fittings are shown or indicated, items shall be in accordance with AWWA C153.

D. Flanged Joints:

1. Threaded Flanges: Shall be solid, threaded, ductile-iron, flanges meeting the requirements of AWWA C115. Threaded flanges andpipe shall be assembled and faced by the pipe manufacturer; field or shop assembly will not be accepted. Threaded flanges shall be screwed on tight without overstressing the threads and, when properly assembled, shall be concentric with the pipe.

2. The dimensions of all flanges for pipe fittings and specials and the number and sizes of bolts, up to and including 54 inches, shall be in accordance with ANSI B16.1, Class 125 standard flanges.

3. For pipe larger than 54 inches, flanged pipe shall have ANSI Class 125 flanges integrally cast solid and at right angles to the pipe axis, and accurately faced and drilled smooth and true. Flange bolt holes shall be back faced or spot-faced as required by ANSI Specifications.

4. Flanges shall be tapped where tap or stud bolts are required.

5. Bolts: Bolts shall be in accordance with Appendix A of AWWA C115 and as follows: Flanged joints shall be made with bolts or stud-bolts with a nut on each end. Bolts, stud-bolts and nuts shall be ANSI heavy dimension, semi-finish, with square heads and cold-punched hexagonal nuts. For bolts 1-3/4 inches in diameter and larger, stud-bolts shall be used. Bolt size shall be American Standard for ANSI Class 125 flanges. Where flanged joints are in manholes or submerged in tanks, bolts, stud-bolts, and nuts shall be silicon bronze, ASTM B98, Alloy A, of dimensions and sizes equal to steel bolts, stud-bolts, and nuts specified in Appendix A of AWWA C115.

6. Gaskets: Flange gaskets shall be in accordance with Appendix A of AWWA C115. They shall be full-face gaskets for flanged joints on 12-inch diameter and smaller pipe and shall be of the ring type for flanged joints on larger pipe.

7. After each flanged joint has been made, all bolt heads and nuts, and all surfaces of the flanges not to be painted shall be given two coats of asphaltic coating meeting the requirements of AWWA C151.

E. Grooved-Type Joints:

1. Shall be in accordance with AWWA C606 and Section 33 05 09.13 - Couplings for Utility Piping.

F. Mechanical and Push-On Type Joints

1. Shall be in accordance with AWWA C111.

G. Flanged Adaptors:

1. Bolt hole and bolt patterns shall conform to the mating flange patterns as specified in the piping paragraphs. Bolts, nuts, and flange gaskets shall conform to the Specifications for the adjacent piping.

2. Shall have ductile iron bodies.

3. Shall be Models 912 as manufactured by:

a. Dresser, Bradford, PA.

b. McWane Inc., Birmingham, AL.

c. Smith-Blair, Inc., Texarkana, AR.

d. Or approved equal.

4. Shall have a rated working pressure of 175 psig.

5. Pipe shall be anchored by using anchor studs drilled into the coupling and connected pipe for nominal pipe size twelve inches and smaller. For nominal pipe sizes over twelve inches, pipe shall be restrained by harnesses or pipe supports as specified for sleeve type couplings.

H. Harnesses:

1. Where shown, specified or required, harnesses for pipe with mechanical joints shall be provided.

2. For ductile-iron pipe and fittings with mechanical joints that require harnessing, restrained type mechanical joint pipe will be considered as an alternate upon submission to the Engineer for approval.

3. Joint Assemblies:

Joint assemblies shall be designed to resist pullout of the joints at the test pressures specified for the piping system.

I. Sleeves:

1. Sleeves shall be in accordance with AWWA C110. They shall be of ductile iron and shall be provided at all points where pipes will pass through walls and floors and where wall or floor castings are not provided. Unless otherwise shown, sleeves shall have intermediate collars not less than 1/2-inch thick and 1-1/2 to 2 inches high located at the center of the wall.

2. For exterior walls of structures, wall sleeves shall be plain ends and of flush wall design.

3. Where shown on the Contract Drawings, modular wall seals shall be installed in the annular space between the pipe and the sleeve. In all other locations, caulk shall be installed in the annular space between the pipe and the sleeve. Caulking materials shall be in accordance with N.Y. Spec 24-C-38. For flanged pipe, sleeves shall be fabricated large enough to accommodate flanges.

J. Sleeve-Type Couplings:

1. Sleeve-type couplings shall be in accordance with Section 33 05 09.13 – Couplings for Utility Piping.

2. Pipe and fittings for use with sleeve-type flexible couplings shall be plain end.

K. Wall Castings, Connecting Pieces, and Special Fittings:

1. Wall castings and connecting pieces shall be in accordance with AWWA C110, 250 psi pressure rating, unless specified otherwise. Concrete encased wall castings connected to sluice gates and valves shall be cast from alloy iron, Ni-Resist Type 1, International Nickel Co. or approved equal. Wall castings and connecting pieces shall be furnished with ANSI Class 125 flanged ends, bell ends, flare ends and/or spigot ends where shown, specified or required.

2. Wall castings shall be of standard wall pipe dimensions, unless piping layout precludes their use, in which case special castings shall be furnished.

3. Design of Specials:

   Special fittings where required shall be of an approved design that meet the same Specifications and have the same diameters and thicknesses as standard fittings. Any tees, crosses, elbows, laterals, reducers or other fittings of current ANSI or AWWA standard dimensions are not considered specials.

4. Intermediate Collar:

   Wall castings shall have an integrally cast intermediate collar not less than 1/2-inch thick and 1-1/2 to 2-inches high located at the center of the wall unless otherwise shown.

5. Where space limitations prevent the use of through bolts for assembling flange connections, stud bolts shall be provided on wall casting flanges.

L. Cleanouts:

1. Cleanouts shall be furnished and installed where shown or specified.

2. Size:

   Cleanout openings shall be not less than 6-inch diameter for pipe 8 inches in diameter or larger. For pipe 6 inches in diameter or smaller, they shall be of the same diameter as the pipe.

3. Cleanout Covers:

   Cleanout covers which are blind flanges shall be in accordance with AWWA C110, except where conformation is required with the inside curvature of the pipe, in which case the covers shall be flanged plugs of proper shape with American Standard flange drilling.

4. Covers shall be fastened by means of steel studs and bronze nuts and shall be drilled and tapped for a 1-1/2-inch diameter pipe connection.

5. Flange plugs shall be equipped with a dowel or other suitable means to provide proper setting.

M. Coatings and Linings:

1. Cement Lining:

   All ductile-iron pipe and fittings shall be furnished with a cement-mortar lining not less than twice the standard thickness and seal coating meeting the requirements of AWWA C104.

2. Glass Lining Pipe and Fittings

   a. Glass lining, pipe and fittings shall consist of a minimum of two glass lining coats, one bonded or primer coat and one finish or gloss coat. Each coating shall be applied in controlled thickness after the inside surface of the pipe has been prepared as required to assure a continuous and unbroken bond of the coating to the pipe. The combined, finished coatings shall have a thickness from 8 to 12 mils, and a surface hardness of at least 6 on the Mohs scale. The bond of the glass lining to the metal shall be sufficient to withstand a strain of 0.001 inch per inch without damage to the glass. Surface of glass shall have a dense, glazed finish non- adherent to grease, scum, wax or other sticky substances found in sludge.

   b. Ensure that firing of pipe and applied coating layers shall provide a complete fusion to the pipe wall. The compounding, firing and annealing technique shall assure a lining capable of withstanding thermal shock up to 260 degrees F without damage to the surface or structure of the coating or to its bond with the pipe material.

   c. Finish coating shall be free from craters, porosity, crazing, scaling, or pinholes evident from visual inspection. Pipe need not meet a spark test for continuity but will be rejected for any faults detectable by visual inspection.

   d. Finish coating shall be resistant to attacks from acids equivalent to a weight loss not greater than 3 milligrams per square inch as determined by the procedure for testing against citric acid, ASTM C283. The coating shall protect against etching or loss of gloss when subjected to cleaning procedures employing a 200 degree F water-steam mixture.

   e. Glass-lined pipe shall not deviate more than 0.0125 inch per foot of length from a centerline perpendicular to the flange face or square end of the pipe.

3. Asphaltic Coating:

Pipe and fittings that will not be exposed to view shall be coated with the standard asphaltic outside coating specified in AWWA C151, at twice the specified thickness. Unlined pipe shall be coated with the standard asphaltic inside coating specified in AWWA C151.

4. Concrete Encased Pipe:

Pipe and fittings which are to be encased in concrete where water-tightness is to be obtained shall not be coated or painted on the outside.

5. Labels:

In addition to the information required to be cast onto the pipe by AWWA C151, the letters "N.Y.C." shall be painted on the outside of each pipe, fitting, and special casting.

6. Pipe Couplings:

Where flexible or rigid couplings are to be used, the exterior coating on the ends of pipe and fittings shall be left off for approximately eight inches, but the interiors shall be lined throughout.

PART 3. EXECUTION

3.01 QUALITY ASSURANCE

A. The pipe and fittings covered by these Specifications shall be provided by the Contractor through qualified manufacturers experienced in the fabrication, castings and manufacture of the pipe materials specified herein. The pipe and fittings shall be designed, fabricated and installed in accordance with standards specified herein.

3.02 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall deliver, store and handle all pipe, fittings and couplings as specified in Contract Documents. Special care in handling shall be exercised during delivery, storage and handling of pipe to avoid damage and setting up stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

B. No material furnished under this Section shall be shipped to the job site until all submittals have been approved.

3.03 INSTALLATION

A. All ductile iron pipe and fittings shall be installed in accordance with the manufacturer's recommendations, approved shop drawings and as specified in the Contract Documents.

B. Where insulation is shown or specified in the Contract Documents, it shall be installed after the installation and testing of the pipe.

C. Where ductile iron pipe is in contact with soils, the pipe shall be encased in polyethylene film in accordance with AWWA C105 to isolate the pipe surface from contact with the soils.

D. Where field cutting of ductile iron pipe is permitted by the Engineer, ductile iron pipe shall be cut only by means of abrasive saws, hack saws, wheel type cutters or milling type cutters. The use of "squeeze" type pipe cutters and cutting torches will not be permitted. Also, the use of diamond points and dog chisels will not be permitted.

E. If the foundation is good, firm earth the earth shall be pared or molded to give a full support to the lower third of each pipe. If the foundation is unstable, or other conditions prevent a proper bearing for the pipe, a bedding of broken stone shall be installed as shown on the Contract drawings. If the excavation has been made deeper than necessary, a bedding of broken stone shall be installed at the Contractor’s expense.

F. When the pipe is to be installed under a roadway a concrete cradle shall be laid to provide a full, firm and even bearing as shown on the Contract Drawings.

G. Trenches shall be promptly backfilled after the installation of pipe or completion of structures, but no backfilling shall be done until the Work has been inspected and approved by the Engineer.

H. Trenches shall be backfilled with clean fill, hand placed and tamped with six (6) inch layers to completely fill all spaces adjacent to the pipe.

I. Temporary Bulkheads:

1. Temporary bulkheads shall be furnished at the ends of pipe sections where adjoining pipe have not been completed and are not ready to be connected.

2. All temporary bulkheads shall be removed when they are no longer needed.

3.04 LEAKAGE TESTS

A. All pipes shall be flushed and cleaned after installation. Pipes shall be tested for leaks in accordance with Section 33 01 12.11 - Leakage Detection.

3.05 CONNECTIONS

A. The Contractor shall do all the Work necessary to join the Ductile Iron Sewer or Water Pipe to the existing sewer or water pipe as shown on the plans. The cost for doing this shall be included in the unit price bid for this item.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 05 71
CLEANOUTS

PART 1 GENERAL

1.01 REQUIREMENTS

A. Under this item, the Contractor shall furnish and install CLEANOUTS of the required location and size in accordance with the plans, Specifications, and directions of the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 03 30 00 – Cast-In-Place Concrete

C. Section 03 21 00 – Reinforcing Steel

D. Section 31 23 16 – Excavation

E. Section 33 42 11 – Stormwater Gravity Piping

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, and equipment necessary to furnish and place the cleanout including concrete, reinforcing steel, formwork, cast iron frame and locking cover, PVC piping, PVC collar, end caps, PVC risers, PVC couplings, and other incidental work and expenses necessary to complete the Work in accordance with the plans and Specifications of the Engineer.

B. The price bid shall be a unit price for EACH CLEANOUT - 4" DIAMETER.

C. The price bid shall be a unit price for EACH CLEANOUT - 6" DIAMETER.

D. The price bid shall be a unit price for EACH CLEANOUT - 8" DIAMETER.

E. The price bid shall be a unit price for EACH CLEANOUT - 10" DIAMETER.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS (NOT USED)

1.05 REGULATORY COMPLIANCE (NOT USED)

CONTRACT GI-CONS-7
SECTION 33 05 71
CLEANOUTS

1.06 SUBMITTALS

A. Shop Drawings: Contractor shall submit shop drawings and catalog data, in accordance with the requirements of Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 Cleanout cast iron frame and locking cover shall be as shown on the Contract Drawings, Model R-6461 or R-6462, manufactured by Neenah Foundry, Neenah, WI, or approved equal.

2.02 PVC piping, PVC collar, end caps, risers, and couplings to be of the type and sizes as indicated in the Contract Documents.

2.03 PVC piping material to match Section 33 42 11 – Stormwater Gravity Piping.

PART 3 EXECUTION

3.01 Necessary watertight and/or soil tight connections to be made between the underground structure and the PVC riser in the locations as specified. Ensure minimum riser length is installed, as shown in the Contract Documents.

3.02 Backfill excavation as required to be able to create forms for the concrete support structure for the cast iron frame and cover.

3.03 Install PVC collar, end caps, and couplings as required, and set frame to the necessary grade prior to concrete pour.

3.04 Pour concrete as required, and restore pavement as shown in Contract Documents, or to match the existing pavement.

3.05 Ensure cleanout cover can be opened as intended and is free from any pavement restoration overflow or debris.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 39 10
SANITARY AND STORM SEWER STRUCTURES

PART 1 GENERAL

1.01 REQUIREMENTS

A. Catch Basins shall be constructed of the sizes and shapes shown and of the types specified complete with frames, gratings, covers, hoods, hooks and all other hardware as shown or required.

B. The Contractor shall provide connections to all catch basins constructed of the sizes, classes and kinds shown, specified or required.

C. The Contractor shall furnish and install manholes, and provide connections to manholes constructed of the sizes, classes and kinds shown, specified or required.

D. This section describes Gray Iron and Malleable Iron Castings in the borough in which the Work is being performed for sewers and appurtenances.

E. Gray iron and malleable iron are not to be used for valves, cast iron pipe or castings subject to high temperatures.

F. This section describes Steel Castings for drainage inlets and manholes.

G. Grating and frames installed within NYC Parks property shall be painted.

H. Catch Basins include:

1. Cast-In-Place Catch basins
2. Precast concrete catch basins
3. Drop inlets
4. Precast concrete drop inlets
5. Yard drains
6. Precast concrete yard drains
7. Curb inlet
8. Precast concrete curb inlet
9. Polymer concrete trench inlet
10. PVC Drain Basin

I. Manholes include:

1. Cast-In-Place Concrete Manholes
2. Precast concrete manholes
3. Frame, Grate and Cover

4. Brick Masonry
5. Hoods
6. Steps/Rungs

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 35 10 – Embankment and Channel Protection
B. Section 03 30 00 – Cast-in- Place Concrete
C. Section 31 23 16 – Excavation
D. Section 04 05 00 – Common Work Results for Masonry
E. Section 01 33 00 – Submittal Procedures
F. Section 03 10 00 – Concrete Forming and Accessories
G. Section 03 32 00 – Joints in Concrete
H. Section 33 01 12.11 – Leakage Detection
I. Section 33 42 11 – Stormwater Gravity Piping
J. Section 32 01 13.62 – Asphalt Surface Treatment
K. Section 33 05 19 – Ductile Iron Utility Pipe

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the bid documents and shall include the cost of all labor, materials, and equipment necessary to furnish and place concrete, including foundation material, steel bars, expansion joints material, formwork, cast iron frame and grating, concrete steps, copolymer polypropylene plastic steps, brick, curb piece, hoods, bituminous coating, as applicable, and other incidental work and expenses necessary to complete the Work in accordance with the plans and Specifications and to the satisfaction of the Engineer.

B. The price bid shall be a unit price for EACH ON-SITE CATCH BASIN.

C. The price bid shall be a unit price for EACH DEP CATCH BASIN.

D. The price bid shall be a unit price for EACH MODIFIED CURB INLET TYPE A CATCH BASIN.

E. The price bid shall be a unit price for EACH DUAL CATCH BASIN.

F. The price bid for TRENCH DRAIN INLETS shall be unit price per LINEAR FOOT.

G. The price bid shall be a unit price for EACH 12” PVC DRAIN BASIN.

H. The price bid shall be a unit price for EACH 18" PVC DRAIN BASIN

I. The price bid shall be a unit price for EACH MANHOLE.

J. The price bid shall be a unit price for EACH STORM DRAINAGE FRAME AND MANHOLE COVER REPLACEMENT and shall include the cost of all labor, materials, and equipment necessary to furnish and place Storm Drainage Frames and Covers in accordance with the plans and Specifications, to the satisfaction of the Engineer. Storm Drainage Frames and Covers required for the installation of new structures will be considered incidental to the Work and not be paid by this unit price item.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Section 03 30 00 – Cast-in- Place Concrete

B. DEP Sewer Design Standard Drawings

C. BWSO Standard Drawing for Catch Basin with Shallow Basin Connection

D. BEPA Standard Drawing for Modified Curb Inlet Type A

E. DEP Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications

F. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

G. ASTM C1439 Standard Test Methods for Evaluating Latex and Powder Polymer Modifiers for use in Hydraulic Cement Concrete and Mortar

H. ASTM C78 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

I. DEP BWSO Standard Sewer and Water Main Specifications

J. DEP Standard Sewer Specification 5.07 – Manholes

K. Gray iron castings must comply with the requirements of ASTM A48.

L. Malleable iron castings must comply with the requirements of ASTM A47.

M. Steel castings must comply with the requirements of ASTM A27.

N. All covers must comply with the requirements of AASHTO M306-10.

O. DEP Standard Designs and Guidelines for Green Infrastructure Practices

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

B. Prior to delivery of precast catch basins the Contractor will be required to submit three (3) copies of the manufacturer's Drill Sheets to the Engineer for review. These sheets shall note all pipe entries, final grades, etc. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each precast catch basin with regard to details, contract plans, standards and Specifications.

C. Prior to delivery of polymer concrete trench inlets the Contractor shall provide three (3) copies of shop drawings to the Engineer for review. The shop drawings shall be prepared at the scale of the construction documents or larger and shall contain all pertinent information regarding installation, including manufacturer, part numbers, dimensions, locations of pipe entries, and final grades. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each precast drainage inlet with regard to details, contract plans, standards and Specifications.

D. Prior to delivery of precast manholes the Contractor will be required to submit three (3) copies of the manufacturer's Drill Sheets to the Engineer for review. These sheets shall note all pipe entries, final grades, etc. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each precast manhole with regard to details, contract plans, standards and Specifications.

E. Foundry certificates for each type of material certifying gray for manhole covers, catch basin covers, drainage inlets, and H-20 loading test shall be submitted. Submittal shall be on the pattern holder's letterhead.

F. Prior to delivery PVC Drain Basin the Contractor shall provide three (3) copies of shop drawings to the Engineer for review. The shop drawings shall be prepared at the scale of the construction documents or larger and shall contain all pertinent information regarding installation, including manufacturer, part numbers, dimensions, locations of pipe entries, and final grades. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each PVC Drain Basin with regard to details, contract plans, standards and Specifications.

G. Precast Modular Sand Filter System

1. Submit Quality control procedures established by the precast manufacturer's Quality Assurance / Quality Control Manual.
2. Manufacturer's design calculations, shop drawings, and installation instructions.
3. Material and installation information on all anchorage, lifting inserts and devices.
4. Material and installation information on all sealants, gaskets, pipe entry connectors, steps, racks, and other items installed before or after delivery.
5. Design loading and material specifications for supplied products.

6. Precast concrete unit design calculations and concrete mix design proportions and appropriate mix design test data.
7. Copies of material certifications and/or laboratory test reports, including mill tests and all other test data, for Portland cement, blended cement, pozzolans, ground granulated blast-furnace slag, silica fume, aggregate, admixtures, and curing compound.
8. Copies of in-plant QA/QC inspection reports.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 GENERAL

A. The Contractor is advised that in lieu of poured-in-place catch basins the substitution of Precast Reinforced Concrete Catch basin. Catch Basins that comply with standard inlet details found in the Contract Drawings will be permitted.

B. Precast and poured-in-place catch basins shall meet NYC DEP requirements and be capable of withstanding an AASHTO HS-20 loading.

C. Contractor may seek permission to substitute, in lieu of poured-in-place manholes, Precast Reinforced Concrete Manholes that comply with the DEP Sewer Design Standards or DPR Standard Drawings TYLA/146-R9.

2.02 MANUFACTURERS

A. Acceptable TRENCH DRAIN INLET manufacturers are:

1. Zurn Industries, LLC, Erie, PA
2. ACO, Inc., Mentor OH;
3. ABT, Inc., Troutman, NC;
4. Or Approved Equal.

B. Acceptable PRECAST MODULAR SAND FILTER SYSTEM manufacturers are:

1. Oldcastle Infrastructure™
   - Toll Free Tel: 888-9-OLDCASTLE (866-965-3227)
   - Email: ContactInfrastructure@Oldcastle.com
   - Web: www.oldcastleinfrastructure.com
2. Or Approved Equal.

2.03 IRON CASTINGS

A. Iron castings must be of the following types:

1. Gray Iron Castings

2. Type 2 - Malleable Iron Castings

B. Gray iron castings must be at least Class No. 30B, with a minimum tensile strength of thirty thousand (30,000) pounds per square inch as per ASTM A48. When a particular chemical composition is required in gray iron castings, it must be as specified.

C. Gray Iron Castings are not to be used for valves, cast iron pipe or castings subject to high temperatures.

D. Malleable iron shall be Grade 32510, ASTM A47.

E. Dome Grate and Frame shall be ductile iron, and shall conform to the minimum dimensions as shown on the Contract Documents.

2.04 STEEL CASTINGS

A. Steel castings must be of one type.

B. Steel must be Grade B-1, Full Annealed.

2.05 SIZE, WEIGHT AND LOT NUMBER

A. Castings must conform to either the Working drawings or patterns or both, as specified.

1. For catch basins, drain inlets, or manholes specified to meet DPR Standard Manhole Covers or Drainage Inlet Covers along with frames, including bolts and keys, shall be furnished as shown on the Contract Drawings.

2. For drainage inlets, catch basins or manholes specified to meet DEP Guidelines for Onsite Green Infrastructure and Design Submittals to DEP, Manhole Covers or Drainage Catch Basins Frame and Grate along with frames, including bolts and keys, shall be furnished as shown on DEP Sewer Design Standards Drawings SE57, SE58, SE59.

B. The weight of each casting must be conspicuously painted thereon in with two coats of black silicone alkyd paint, such as Steel Masters 9500 manufactured by Sherwin Williams, Woodside, NY or approved equal.

C. Iron castings must have the initials of the manufacturer’s name, the date of manufacture and the initials of the plant of manufacture integrally cast on it at the time of manufacture.

D. Steel castings must have a lot number integrally cast on it at the time of manufacture.

2.06 MATERIALS

A. Concrete shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete and below:

1. For precast reinforced concrete manholes, concrete shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete, except that the concrete shall have a concrete design mix for five thousand (5,000) pounds per square inch (minimum twenty-eight (28) day compressive strength of four thousand (4,000) pounds per square inch). The maximum allowable chloride content in the concrete shall not exceed one-tenth (1/10) of one percent by weight of cement. The maximum water/cement ratio shall not exceed forty-seven (47) percent by weight.

B. Portland Cement shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete and shall be Type II unless otherwise specified. Coarse and Fine Aggregate for concrete shall be well graded in accordance with Section 03 30 00 – Cast-in-Place Concrete. Size of Coarse Aggregate shall be three-quarter (3/4) inch unless smaller size aggregate is required due to nature of work.

C. Frames and covers shall be of cast iron, unless otherwise shown on the Contract plans, complying with the requirements of Section 22.01 of DEP's Standard Sewer and Water Main Specifications (July 2014 or latest version), Type 1. Malleable iron or cast steel covers, when required, shall comply with the requirements of Section 33 39 10 – Sanitary and StormSewer Structures.

D. Rungs shall be copolymer polypropylene plastic manhole steps with one-half (1/2) inch Grade 60 steel reinforcement and shall comply with the DEP Sewer Design Standards or formed concrete steps.

E. Brick and brick masonry shall comply with the requirements of Section 04 05 00 –Common Work Results for Masonry.

F. Cement mortar shall comply with the requirements of Section 04 05 00 – Common Work Results for Masonry.

G. Reinforcement shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

H. Reinforcement shall comply with the requirements of Section 03 21 00 – Reinforcing Steel.

I. Ductile iron pipe and fittings shall comply with the requirements of Section 33 05 19 – Ductile Iron Utility Piping.

J. Cement grout will comply with the requirements of Section 03 60 00 – Grouting.

K. Welded Steel Wire Fabric shall comply with the requirements of Section 03 30 00 – Cast-

in-Place Concrete and shall have a minimum specified yield strength of sixty-five thousand (65,000) pounds per square inch.

L. High range water reducing admixtures meeting the requirements of ASTM C494 Type F and having been previously approved by the New York State Department of Transportation may be used.

M. Concrete for cradle and encasement will comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

N. Concrete forms shall comply with the requirements of Section 03 10 00 – Concrete Forming and Accessories.

O. Concrete joints shall comply with the requirements of Section 03 32 00 –Joints in Concrete.

P. Hoods shall be furnished as shown on DEP Sewer Design Standards Drawing SE60.

Q. Polymer concrete shall be manufactured from polyester polymer concrete with the following minimum properties:

1. Compressive strength: 14,000 psi per ASTM C579
2. Flexural strength: 4,000 psi per ASTM C580
3. Water absorption 0.07% per ASTM C97

R. The iron and steel must be such that it will make castings. The castings are to be of close and even grain and easily machined. All covers shall be suitable for highway traffic, meeting the requirements for heavy duty H-20 loading, per AASHTO M306-10.

S. Casting must be true to pattern, free from cracks, gas holes, flaws and excessive shrinkage. Surfaces of castings must be free from burnt on sand and be reasonably smooth after cleaning. Runners, risers, fins and other cast on pieces must be removed. Plugging and filling will not be allowed.

T. When "machining" is specified or shown on the Working drawings, it means the use of a machine or machines having cutting tool or tools to produce such surfaces and dimensions to a true and even surface.

U. The underside of the seating rim of manhole covers will be machined. The upper side of the cover seating rims of manhole heads will also be machined.

V. BOLT AND KEY - For work on Department of Parks and Recreation Property, each cover shall be furnished with two (2) Stainless Steel Penta-Head bolts as supplied by Campbell Foundry Co., Harrison, NJ, or approved equal. Two (2) keys shall be furnished per site. For security reasons, keys shall be shipped by McGard (or approved equal) directly to, Executive Assistant to the Deputy Commissioner, NYC Parks Olmsted Center, Corona, NY 11368.

2.07 TRENCH DRAIN INLET

A. E. 233rd Street Tennis Courts

1. Z886-ST, 6-1/4 [159] WIDE REVEAL RADIUSED TRENCH DRAIN SYSTEM, or approved equal that matches the existing system in visible and functional characteristics including:
    - Channel material and appearance
    - Nominal width
    - Grade material and style
    - Frame type
    - Accessories

2.08 CHEMICAL AND PHYSICAL REQUIREMENTS

A. Gray iron castings shall comply with the requirements of ASTM A48
.

B. Malleable iron castings shall comply with the requirements of ASTM A47.

C. When a particular chemical composition is required in gray iron castings, it shall be as specified.

D. Steel castings shall comply with the requirements of ASTM A27.

2.09 12” AND 18” PVC DRAIN BASIN

A. PVC DRAIN BASIN shall be mated directly to the piping with watertight seals and fittings.

B. PVC drain basin shall match dimensions and elevations shown on the Contract Drawings.

C. 12” PVC DRAIN BASIN

1. Nyloplast 12” Inline Drain, Part # 2712AG, or approved equal.

2. Neenah Inlet Frame and Beehive Grate, part # R-2560-G/C, or Nyloplast Grate and Frame, Part # 1299CGD-L, or approved equal.

3. The locking mechanism shall be a steel cable with one looped end attached to the grate bars and another looped end attached to the eyebolt set in concrete ring.
    a. Stainless Steel Eyebolt shall have a minimum eye inside diameter of one and a half inch (1-1/2”) and three inch (3”) shank length with washer and nut at the end of shank set into concrete ring.

D. 18” PVC DRAIN BASIN

1. Nyloplast 18” Inline Drain, Part # 2818AG, or approved equal.

2. Nyloplast grate and frame, Part # 1899CGD, or approved equal.

3. The dome locking grate assembly shall be Nyloplast, Part # 1230DOMELOCK, or approved equal.

2.10 PRECAST MODULAR SAND FILTER SYSTEM

A. Systems shall be designed by the manufacturer and supported by sealed engineering calculations demonstrating structural adequacy, groundwater resistance, and compatibility with site conditions.

B. Manufacture shall conform to the producer's acceptable quality control manual.

1. Forms
    a. Forms for manufacturing precast concrete units shall be of the type and design consistent with industry standards and practices. They should be capable of consistently providing uniform products and dimensions. Forms shall be constructed so that the forces and vibrations to which the forms will be subjected cause no damage to the precast concrete unit.
    b. Forms shall be cleaned of concrete build-up after each use.
    c. Form release agents shall be applied according to the manufacturer's recommendations and shall not be allowed to build up on the form casting surface.
2. Reinforcement
    a. Cages of reinforcement shall be fabricated by tying the bars, wires or welded wire reinforcement. The tolerances for concrete cover shall be 3/8 in. or as specified in the design. Welding shall be allowed only for ASTM A 706 rebar.
    b. Positive means shall be taken to assure that the reinforcement does not move significantly during the casting operations.
3. Embedded Items
    a. Embedded items shall be positioned at locations specified in the design documents. Inserts and other embeds shall be held rigidly in place so that they do not move significantly during casting operations.
4. Concrete
    a. Concrete Mixing
        i. Mixing operations shall produce batch-to-batch uniformity of strength, consistency and appearance
        ii. Batching weight and volume measurement devices shall be annually calibrated by an independent testing laboratory or more frequently if batching irregularities or concrete inconsistencies are observed.
    b. Concrete Placing
        i. Concrete shall be placed in a manner in which it flows and consolidates without segregation or air entrapment. The freefall of concrete shall be kept to a minimum.
        ii. Cold Weather Concreting

1. Recommendations for cold weather concreting are given in detail in ACI 306 R. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near-freezing temperatures. All concrete materials, reinforcement, and forms shall be free from frost. In cold weather, the temperature of the concrete at the time of placement shall not be below 45 degrees F. Concrete that freezes before it reaches a compressive strength of 500 psi shall be discarded.

iii. Hot Weather Concreting

1. Recommendations for hot weather concreting are given in detail in ACI 305 R. During hot weather excessive concrete temperatures and water evaporation shall be minimized. The temperature of concrete at the time of placing shall not exceed 95 degrees F.

c. Concrete Curing

i. Curing operations shall commence immediately following the initial set of the concrete and completion of surface finishing.

ii. Curing by moisture retention

1. Precast products shall be protected from drafts and wind to prevent plastic shrinkage cracking.
2. Moisture shall be prevented from excessively evaporating from exposed surfaces until adequate strength for stripping the precast concrete unit from the form is reached.

iii. Curing with Heat and Moisture

1. Concrete shall not be subjected to steam or hot air until after the concrete has attained its initial set. If hot air is used, precautions shall be taken to prevent moisture loss from the concrete. The temperature of the concrete shall not be permitted to exceed 150 degrees F. The temperature gain shall not exceed 40 degrees F per hour.

d. Surface Finish

i. The surface finish shall be as specified on the contract documents and/or approved shop drawings.

e. Stripping Precast Concrete Units from Forms

Precast concrete units shall not be removed from the forms until the concrete reaches the compressive strength for stripping required by design. Stripping strengths shall be routinely measured to ensure product has attained sufficient strength for safe handling.

f. Patching and Repair

i. Repairing Minor Defects
    1. Defects that will not impair the functional use or expected life of the precast concrete unit may be repaired by any method that does not impair the product.

ii. Repairing Honeycombed Areas
    1. When honeycombed areas are to be repaired, all loose material shall be removed and the areas cut back into essentially horizontal or vertical planes to a depth at which coarse aggregate particles break under chipping rather than being dislodged. Proprietary repair materials shall be used in accordance with the manufacturer's instructions. Otherwise, the area shall be saturated with water. Immediately prior to repair, the area should be damp, but free of excess water. A cement-sand grout or an approved bonding agent shall be applied to the chipped surfaces, followed immediately by consolidating an appropriate repair material into the cavity.

iii. Repairing Major Defects
    1. Defects in precast concrete products which impair the functional use or the expected life of products shall be evaluated by qualified personnel to determine if repairs are feasible and, if so, to establish the repair procedure.

g. Shipping Precast Concrete Units
    i. Precast concrete units shall not be shipped until they have reached at least 70% of their specified 28-day design strength, unless damage will not result, impairing the performance of the product.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS FOR CATCH BASIN CONSTRUCTION

A. Catch basins shall be constructed of the sizes and dimensions and of the types, and at the locations and to the elevations shown on the Contract Drawings or as directed by the Engineer.

B. Precast reinforced concrete catch basins shall be manufactured in one (1) piece, as shown on the Contract Drawings.

C. Catch basins shall be installed in accordance with final grade. The brick masonry or concrete for catch basins shall be built to within such distance of the final grade as shown,

specified or ordered.

D. The minimum dimensions, minimum reinforcement and minimum requirements utilized for the construction of precast reinforced concrete catch basins shall conform to the Contract documents.

E. Pre-cast concrete is an acceptable material substitute for the sidewalls of catch basin.

F. The Contract Drawings are diagrammatic, but shall be followed as closely as conditions at the site of work or the other trades will permit.

3.2 GENERAL REQUIREMENTS FOR CATCH BASIN CONNECTIONS

A. Catch basin connections will be constructed of the sizes, classes and kinds, and to the lines and grades shown on the Contract Drawings, specified or as ordered by the Engineer. The Engineer may direct that the inverts of basin connections be lowered or raised, so as to meet conditions encountered at the time of construction. The cost of this Work is deemed included in the Contract price bid for the various green infrastructure practices, as indicated in Section 1.03 Payment.

B. Catch basin connection pipe or catch basin connection pipe openings will not be permitted through the corner of catch basins. The distance from the edge of a pipe or an opening to the inside face of the adjoining wall must be a minimum of three inches.

C. The location and angle of inlet connections may be varied to suit field conditions. Inlet connections must be installed with a minimum drop of six inches from the inlet to the sewer.

D. All catch basin connection pipe openings shall conform to the sizes, dimensions and requirements specified on the DEP Sewer Design Standards Drawings for Precast Catch Basins. All catch basin connection pipe openings shall be provided for at the time of manufacture.

E. Shallow catch basin connections, where indicated, shall conform to the sizes, dimensions and requirements specified on the BWSO Standard Drawing for Catch Basin with Shallow Basin Connection.

3.3 GENERAL REQUIREMENTS FOR MANHOLES

A. Manholes shall be constructed of the sizes and dimensions, and of the types, and at the locations and to the elevations shown on the plans or as directed by the Engineer, and as shown on the DEP Sewer Design Standards or DPR Standard Drawings TYLA/146-R9.

B. The minimum dimensions, minimum reinforcement and minimum requirements utilized for the construction of precast reinforced concrete manholes shall conform to the DEP Sewer Design Standards or DPR Standard Drawings TYLA/146-R9 that are hereby incorporated and deemed a part of this Contract.

3.4 GENERAL CONSTRUCTION PROVISIONS FOR MANHOLES

A. The requirements of DEP Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications Division IV – General Construction Provisions shall apply to the Work to be done hereunder.

3.5 GENERAL REQUIREMENTS FOR MANHOLE CONNECTIONS

A. All sewer pipe openings shall conform to the sizes, dimensions and requirements specified on the Sewer Design Standards for Precast Manholes. All sewer pipe openings shall be provided with two (2) number four (4) reinforcement bar hoops around each opening and each opening shall be provided for at the time of manufacture.

B. Openings installed in the field shall be as indicated on the Contract Drawings. The Engineer must approve coring machines and coring methods. If openings are required to be installed in the field, Contractor shall verify that the manhole will retain its AASHTO HS-20 load rating after the openings are created.

C. Pipe openings will not be permitted through joints. The distance from the top or bottom of any section to the opening shall be a minimum of three (3) inches plus the joint depth for cast pipe openings and a minimum of twelve (12) inches plus the joint depth for cored openings for basin connections.

3.6 GENERAL CONSTRUCTION PROVISIONS FOR CATCH BASIN CONSTRUCTION

A. INCIDENTAL WORK - The Contractor shall furnish materials for and do all incidental work to complete the structures, including the Work of setting and adjusting frames, and plastering. No additional payment will be allowed for the aforesaid, but the cost thereof will be deemed to have been included in the prices bid for each item.

3.7 CATCH BASIN CONSTRUCTION

A. Catch basins shall be built of the sizes and dimensions, and of the types, shown on the Contract Drawings or as directed by the Engineer. The following shall apply:

1. The concrete for bases of catch basins shall be deposited continuously for their entire area together with keys. Bases shall be carefully protected from all injury during the progress of the Work. The bases of catch basins shall be true and smooth.

2. Concrete in sidewalls of catch basins shall be deposited continuously to the height and to the thickness approved and for their entire length.

3. Concrete in roofs of catch basins shall be deposited continuously for the full depths, and for the entire widths and lengths of the roofs. The outer surfaces of roofs shall be finished true and smooth.

B. Concrete cradles of polymer concrete trench inlets shall be deposited per manufacturer's requirements – to meet AASHTO HS-20 loading requirements.

C. The locations of the catch basins shown on the plans are approximate only. The Contractor shall, with the approval of the Engineer, establish the catch basin locations taking into consideration the following:

1. Drainage of the area to the catch basin location.

2. Damage to trees or their root systems.

D. SETTING FRAMES, GRATES AND COVERS - The brick masonry or concrete for the catch basins shall be built to within such distance of the final grade as shown, specified or ordered. With the exception of those for POLYMER CONCRETE TRENCH INLETS, frames, grates and covers shall be as shown in the Contract Drawings. The frames shall be set on the masonry or concrete in a full bed of stiff fresh cement mortar. Grates for POLYMER CONCRETE TRENCH INLETS shall be ductile iron, ADA compliant, and be supplied with a locking mechanism compatible with the polymer concrete trench inlets and in-line catch basins as directed by the product manufacturer.

E. REMOVAL OF FORMS - Forms shall be removed in accordance with DEP Standard Specifications for On-Site Green Infrastructure Section 03 30 00 – Cast-in-Place Concrete

F. REINFORCEMENT - The steel reinforcement shall be of the dimensions and shapes shown, and installed in the manner specified in DEP Standard Specifications for On-Site Green Infrastructure Section 03 30 00 – Cast-in-Place Concrete.

G. CONNECTIONS - All connections to catch basins shall be constructed as shown on the plans or as directed. All connections for future catch basin connections shall be closed with bulkheads of brick masonry eight (8) inches thick, unless otherwise shown on the plans or specified.

Catch basin connection pipe or catch basin connection pipe openings will not be permitted through the corner of catch basins. The distance from the edge of a pipe or an opening to the inside face of the adjoining wall shall be a minimum of three (3) inches.

3.8 CATCH BASIN CONSTRUCTION WHERE NO CURB EXISTS

A. Where there are no existing curbs, the Contractor shall survey the area and where possible, locate the proposed catch basin and use a three (3) inch thick asphalt apron to direct the surface flow to the new catch basin. A swale shall be created for a minimum of three (3) feet around the catch basin.

B. All work for catch basin construction where no curb exists shall be done in accordance with the Contract.

C. Where no curbs exist, catch basins shall be staked out (lines and grades) by a L.S. or a

N.Y.S.P.E., and signed and sealed layout sheets shall be submitted to the Engineer prior to excavation. The Contractor shall install the catch basins in accordance with the submitted layout sheets.

3.9 GENERAL CONSTRUCTION PROVISIONS FOR MANHOLE CONNECTIONS

A. During the progress of the Work the exposed ends of pipe sewers must be provided with approved temporary covers fitted to the pipe so as to exclude earth and other materials.

B. The ends of the pipe that enter masonry walls must be cut to fit the inner face of the masonry. Unless otherwise directed, such cutting must be done before the pipes are built in.

C. DAMAGED PIPE - Pipe damaged from handling or during drainage inlet construction, must be replaced and removed from the site of the Work by and at the sole expense of the Contractor.

D. CONNECTIONS TO STRUCTURES - Where openings are not provided in manholes and chambers for connection of drainage pipe connections, the Contractor shall core openings in the walls of the manholes and chambers for manhole connections as directed by the Engineer. The maximum diameter of the cored opening for manhole connections will be sixteen inches. The use of pneumatic percussion hammers will not be permitted in order to provide an opening for manhole connections.

E. SETTING FRAME - Frames shall be adjusted to the final grades by the use of cement mortar or by brick masonry set in cement mortar as directed by the Engineer.

F. CONTRACT DRAWINGS - The Contract Drawings are diagrammatic, but shall be followed as closely as conditions at the site of work or the other trades will permit. As the Work progresses, these drawings may be revised or supplemented by the Engineer, to illustrate the Work further, and the Contractor shall perform the Work required by such revisions or supplements without additional compensation unless the Engineer determines that any such changes warrant additional compensation.

G. INCIDENTAL WORK - The Contractor shall furnish materials for and do all incidental work to complete the structures, including the Work of setting and adjusting frames, and plastering. No additional payment will be allowed for the aforesaid, but the cost thereof will be deemed to have been included in the prices bid for each item.

3.10 MANUFACTURE OF PRE-CAST REINFORCED CONCRETE CATCH BASINS AND TRENCH DRAIN INLETS

A. Precast catch basins shall be built in conformance with the standard drawings and shall be cast in steel forms.

B. Devices used to position reinforcement shall be made of, or coated with, material so that corrosion of the device will not occur. Sufficient devices shall be provided to position the reinforcement for required concrete cover.

C. Concrete shall be thoroughly consolidated by internal or external vibration or a combination of both.

3.11 MANUFACTURE OF PRECAST REINFORCED CONCRETE MANHOLES

A. Precast manholes shall be built in conformance with the standard drawings and shall be cast in steel forms.

B. Devices used to position reinforcement shall be made of, or coated with, material so that corrosion of the device will not occur. Sufficient devices shall be provided to position the reinforcement for required concrete cover.

C. Concrete shall be thoroughly consolidated by internal or external vibration or a combination of both.

3.12 CURING OF PRE-CAST REINFORCED CONCRETE CATCH BASINS AND TRENCH DRAIN INLETS

A. All precast catch basins shall be subjected to curing by one of the following methods:

1. STEAM CURING:

Catch basins may be placed in a curing chamber, free from outside drafts, and cured in a moist atmosphere maintained at a temperature between one hundred (100) degrees Fahrenheit and one hundred sixty (160) degrees Fahrenheit, by the injection of steam for a period of not less than twelve (12) hours or, when necessary, for such additional time as may be needed to enable the pipe to meet the strength requirements. Steam curing shall not commence until at least two (2) hours have elapsed since completion of placement of concrete in the forms. When a curing chamber is not available, catch basins may be placed in an enclosure of canvas and subjected to steam around the entire catch basin at the temperature and for the time specified above. The enclosure shall be so erected as to allow full circulation of steam around the entire catch basin. The interior surface of the curing room or canvas jackets and the surfaces of the catch basin shall be entirely moist at all times.

2. WATER SPRAY CURING:

Under the conditions of enclosure described in the above paragraph on "Steam Curing", catch basins may be cured by subjecting them to a continuous fine spray of water in an enclosure maintained at a temperature of not less than seventy (70) degrees Fahrenheit for a period of not less than seventy-two (72) hours or such

additional time as may be necessary to meet the strength requirements.

3. SATURATED COVER CURING:

The sides and top of each catch basin shall be covered with heavy burlap or other suitable material saturated with water before applying and kept saturated at a temperature of not less than seventy (70) degrees Fahrenheit for seventy-two (72) hours or such additional time as may be necessary to meet the strength requirements.

B. Precast catch basins shall not be subjected to freezing temperatures until the required twenty-eight (28) day compressive strength is achieved.

3.13 INSTALLATION OF PRE-CAST REINFORCED CONCRETE CATCH BASINS

A. All precast catch basins shall be installed in accordance with the standards and Specifications for Precast Catch basins and as directed by the Engineer.

B. Where directed by the Engineer, a two (2) inch thick select granular fill cushion shall be provided in order to assure uniform bedding at subgrade. The cost of the above work shall be deemed included in the prices bid for the catch basins.

3.14 INSTALLATION OF TRENCH DRAIN INLETS

A. All polymer concrete trench inlet bodies and in-line catch basins shall be installed according to the manufacturer's installation instructions and recommendations.

3.15 INSTALLATION OF PVC DRAIN BASIN

A. All PVC Drain Basin shall be installed according to the manufacturer's installation instructions and recommendations.

3.16 INSTALLATION OF GRATINGS AND FRAMES FOR CATCH BASINS

A. Immediately prior to final acceptance, the Contractor shall clean cover surfaces that show evidence of loose mill scale, non-adherent rust, peeling paint and other deleterious matter in accordance with guideline recommended by The Society for Protective Coatings (SSPC) – SP2, or equivalent method for Hand Tool Cleaning, a method generally confined to wire brushing, sandpaper, hand scrapers or hand impact tools. Unless otherwise directed by the Engineer, covers shall be painted with two coats of black alkyd urethane enamel paint, such as Industrial Water Based Alkyd Urethane Enamel manufactured by Sherwin Williams, Woodside, NY, Alkyd Urethane Enamel Closs CV2000 manufactured by Benjamin Moore & Co., Montvale, NJ, or approved equal.

3.17 MARKINGS ON PRE-CAST REINFORCED CONCRETE CATCH BASINS

A. The manufacturer shall mark each catch basins with permanent markings on the inside of each catch basin. The following minimum information shall be listed:

1. Date of Manufacture

2. Manufacturer's Logo

3. Individual Piece Identification

4. ASTM Designation

3.18 DELIVERY OF PRE-CAST REINFORCED CONCRETE CATCH BASINS AND TRENCH DRAIN INLETS

A. No catch basin shall be delivered to the job site until they have attained the specified twenty-eight (28) day compressive strength as evidenced by cylinder testing. In addition, five (5) copies of all test results, steel supplier certifications, independent Testing Laboratory certifications, and fabrication and manufacture certifications must be submitted to the Engineer prior to delivery or at the time of delivery.

3.19 GENERAL CONSTRUCTION PROVISIONS FOR CATCH BASIN CONNECTIONS

A. During the progress of the Work the exposed ends of pipe sewers must be provided with approved temporary covers fitted to the pipe so as to exclude earth and other materials.

B. The ends of the pipe that enter masonry walls must be cut to fit the inner face of the masonry. Unless otherwise directed, such cutting must be done before the pipes are built in.

C. DAMAGED PIPE - Pipe damaged from handling or during catch basin construction, must be replaced and removed from the site of the Work by and at the sole expense of the Contractor.

D. CONNECTIONS TO STRUCTURES - Where openings are not provided in manholes and chambers for connection to drainage piping, the Contractor shall core openings in the walls of the manholes and chambers for catch basin connections as directed by the Engineer. The maximum diameter of the cored opening for catch basin connections will be sixteen inches. The use of pneumatic percussion hammers will not be permitted in order to provide an opening for catch basin connections.

3.20 GENERAL CONSTRUCTION PROVISIONS FOR PRE-CAST REINFORCED CONCRETE MANHOLES

A. JOINTS AND GASKETS - Each section of precast reinforced concrete manhole shall be provided with lap and spigot joints that will permit water tight and permanent joints. The minimum lap shall be that shown on the standard details. Gaskets shall be provided at all joints and shall be either 7/8" x 7/8" or 1" diameter Self Sealing Butyl Gasket (quality equal to Federal Specification No. SS-S-00210) or "0" Ring Gaskets with the size as specified on

the standards drawings. "0" Ring Gaskets shall meet the following requirements.

1. For Type 4 Joint (Ring Rubber Gasket of Circular Cross Section and Grooved Spigot Joint), the thickness of the pipe at the root of the bell or socket shall not be less than one-half (1/2) the thickness of the pipe barrel. The length of the spigot and the depth of the bell or socket shall be equal and shall be a minimum of three (3) inches. The conic surfaces of the inside of the bell or socket and the outer surface of the spigot shall be parallel and the angle of taper on these conic surfaces with respect to the longitudinal axis of the pipe shall not exceed two (2) degrees. The spigot end of the pipe shall be grooved a minimum distance of three-quarter (3/4) inch from the end of the spigot to the edge of the groove. The dimensions of the groove shall be such that the area of the groove plus the annular space immediately adjacent to the groove shall be ten (10) percent to fifteen (15) percent smaller than the area of the ring gasket when the gasket is in position in the groove prior to the joining of the pipe sections.

3.21 CONCRETE MANHOLES CONSTRUCTION

A. Concrete manholes shall be built of the sizes and dimensions, and of the types, shown on the plans or as directed by the Engineer, and as shown on the Sewer Design Standards. The following shall apply:

1. Inverts of manholes shall be formed between transverse templates and shall be screeded. Where the radii of inverts are too small to permit screeding between templates, the inverts shall be shaped by means of interior forms. The concrete for inverts shall be deposited continuously for their entire cross section and length of manhole. Inverts shall be carefully protected from all injury during the progress of the Work. The inverts of manholes shall be troweled smooth.

2. Concrete in sidewalls of manholes shall be deposited continuously to the height and to the thickness approved and for their entire length.

3. Concrete in roofs of manholes shall be deposited continuously for the full depths, and for the entire widths and lengths of the roofs. The outer surfaces of roofs shall be finished true and smooth.

B. STEPS AND LADDERS - The Contractor shall furnish and install in the manholes, steps and ladders of the size, shape and spacing shown on the plans and on the Sewer Design Standards. Steps and ladders or other step or ladder hardware shall be placed integrally with the concrete or shall be installed by drilling a core hole and either installing a thermoplastic insert or expansion anchor to except hardware, or setting hardware into nonshrink fresh grout or an approved nonshrink compound.

C. SETTING FRAMES AND COVERS - The brick masonry or concrete for the manholes shall be built to within such distance of the final grade as shown, specified or ordered.

Frames and covers shall be as shown on the Sewer Design Standards. The frames shall be set on the masonry or concrete in a full bed of stiff fresh cement mortar.

D. REMOVAL OF FORMS - Forms shall be removed in accordance with Section 03 30 00 – Cast-in-Place Concrete.

E. REINFORCEMENT AND STRUCTURAL STEEL - The steel reinforcement shall be of the dimensions and shapes shown, and installed in the manner specified in Section 03 21 00 – Reinforcing Steel . Structural steel shall be of the shapes and sizes shown, and installed as directed.

F. BULKHEADS - Approved construction joint bulkheads with provisions for keying and doweling for future sewers shall be provided, where shown or required.

G. CONNECTIONS - All connections to manholes of existing, new or future sewers and drainage inlet connections shall be constructed as shown on the plans or as directed. All connections for future sewers shall be closed with bulkheads of brick masonry eight (8) inches thick, unless otherwise shown on the plans or specified.

H. WATERSTOPS - Waterstops shall be provided between each successive pour in accordance with Section 25.04 of DEP's Standard Sewer and Water Main Specifications (July 2014 or latest version).

3.22 CURING OF PRECAST REINFORCED CONCRETE MANHOLES

A. All precast sections shall be subjected to curing by one of the following methods:

1. STEAM CURING

Sections may be placed in a curing chamber, free from outside drafts, and cured in a moist atmosphere maintained at a temperature between one hundred (100) degrees Fahrenheit and one hundred sixty (160) degrees Fahrenheit, by the injection of steam for a period of not less than twelve (12) hours or, when necessary, for such additional time as may be needed to enable the pipe to meet the strength requirements. Steam curing shall not commence until at least two (2) hours have elapsed since completion of placement of concrete in the forms. When a curing chamber is not available, sections may be placed in an enclosure of canvas and subjected to steam around the entire section at the temperature and for the time specified above. The enclosure shall be so erected as to allow full circulation of steam around the entire section. The interior surface of the curing room or canvas jackets and the surfaces of the section shall be entirely moist at all times.

2. WATER SPRAY CURING

Under the conditions of enclosure described in the above paragraph on "Steam Curing", sections may be cured by subjecting them to a continuous fine spray of water in an enclosure maintained at a temperature of not less than seventy (70) degrees Fahrenheit for a period of not less than seventy-two (72) hours or such additional time as may be necessary to meet the strength requirements.

3. SATURATED COVER CURING

The sides and top of each section shall be covered with heavy burlap or other suitable material saturated with water before applying and kept saturated at a temperature of not less than seventy (70) degrees Fahrenheit for seventy-two (72) hours or such additional time as may be necessary to meet the strength requirements.

B. Precast Sections shall not be subjected to freezing temperatures until the required twenty-eight (28) day compressive strength is achieved.

3.23 INSTALLATION OF PRECAST REINFORCED CONCRETE MANHOLES

A. All precast manholes shall be installed in accordance with the standards and Specifications for Precast Manholes and as directed by the Engineer.

3.24 MARKINGS OF PRECAST REINFORCED CONCRETE MANHOLES

A. The manufacturer shall mark each individual piece with permanent markings on the inside of each section. The following minimum information shall be listed:

1. Date of Manufacture

2. Manufacturer's Logo

3. Individual Piece Identification

4. ASTM Designation

3.25 DELIVERY OF SECTIONS OF PRECAST REINFORCED CONCRETE MANHOLES

No sections shall be delivered to the job site until they have attained the specified twenty-eight (28) day compressive strength as evidenced by cylinder testing. In addition, five (5) copies of all test results, steel supplier certifications, independent Testing Laboratory certifications, and fabrication and manufacture certifications must be submitted to the Engineer prior to delivery or at the time of delivery.

3.26 TEST AND GUARANTEES

A. Testing and Inspection of the storm system shall be in conformance with New York City Department of Environment Protection, Bureau of Water and Sewer Operations and Section 33 01 12.11- Leakage Detection. All tests required by the Engineer shall be made under the supervision of the Engineer.

B. Concrete utilized in the construction of precast reinforced concrete catch basins shall be tested in conformance with Section 03 30 00 – Cast-in-Place Concrete, with the exception that the concrete, steel reinforcement, fabrication and manufacture shall be tested and certified as to compliance by an independent Testing Laboratory licensed in the State of New York and approved by the Department of Environmental Protection.

C. Hydrostatic Tests, identical to those performed for Reinforced Concrete Pipe, and as defined in these Specifications shall be performed and must be satisfactorily completed prior to acceptance.

D. Testing shall also conform to all applicable sections of Section 03 30 00 – Cast-in-Place Concrete, Section 04 05 00 – Common Work Results for Masonry, and Section 33 39 10 – Sanitary and Storm Sewer Structures.

E. Testing shall also conform to all applicable sections of DEP Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications DIVISION III - Inspection of Materials, Sampling, and Methods of Test.

F. In addition, all manufacture of catch basins shall be witnessed by an approved licensed independent Testing Laboratory and Certified as to Compliance with the standard drawings and with these Specifications.

G. The cost of all testing as described above shall be deemed included in the price bid per manhole.

H. When installation of any part thereof is completed and ready for operation, and prior to final payment, inspection and tests may be made by the Engineer of all materials and appliances installed under this Contract. The Contractor shall furnish all materials, instruments, and labor required for such tests. Should inspection and tests show that any material or workmanship are not first class or not in the opinion of the Engineer in accordance with the drawings and Specifications, the Contractor, on written notice, shall remove same and replace with other material in conformity with the Specifications at no additional cost to the City.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 42 11
STORMWATER GRAVITY PIPING

PART 1 GENERAL

1.01 REQUIREMENTS

A. This section describes various size High Density Polyethylene (HDPE) pipe and Polyvinyl Chloride (PVC) pipe, fittings, flanges, unions, couplings, and Inline Check Valve, as described in the Specifications, shown on the Contract Drawings, or as required for a complete installation. Install all perforated and solid pipes and fittings and inline check valves in accordance with the Specifications, the manufacturers' recommendations, and approved Shop Drawings.

B. All work related to BWSO water and sewer utilities will be inspected and approved by BWSO Construction Unit. All required documents listed in the BWSO Pre-Construction Checklist shall be submitted to BWSO Construction Unit prior to the pre-construction meeting.

C. New BWSO catch basin connections shall be installed per DEP Standard Specifications for On-Site Green Infrastructure Section 33 05 19 Ductile Iron Utility Piping and NYC DEP Standard Sewer and Water Main Specifications Sections 52.11 Catch Basin Connections, 60.11 Furnishing and Delivering Ductile Iron Pipe, Section 60.12 – Laying Ductile Iron Pipe and Fittings, and Section 60.13 Furnishing and Delivering Ductile Iron Fittings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures

B. Section 01 71 30 – Protection and Restoration of Structures

C. Section 33 39 10 – Sanitary and Storm Sewer Structures.

D. Section 31 05 16 – Aggregates for Earthwork.

E. Section 31 23 16 – Excavation

F. Section 33 01 12.11 – Leakage Detection

1.03 PAYMENT

A. The price bid shall be a Unit price per LINEAR FOOT of laying length of 4 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

B. The price bid shall be a Unit price per LINEAR FOOT of laying length of 6 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

C. The price bid shall be a Unit price per LINEAR FOOT of laying length of 8 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

D. The price bid shall be a Unit price per LINEAR FOOT of laying length of 10 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

E. The price bid shall be a Unit price per LINEAR FOOT of laying length of 12 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

F. The price bid shall be a Unit price per LINEAR FOOT of laying length of 15 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

G. The price bid shall be a Unit price per LINEAR FOOT of laying length of 18 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

H. The price bid shall be a Unit price per LINEAR FOOT of laying length of 21 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

I. The price bid shall be a Unit price per LINEAR FOOT of laying length of 24 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

J. The price bid shall be a Unit price per LINEAR FOOT of laying length of 30 INCH DIAMETER OF HDPE PIPE as shown in the Contract Drawings.

K. The price bid shall be a Unit price per LINEAR FOOT of laying length of 8 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

L. The price bid shall be a Unit price per LINEAR FOOT of laying length of 10 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

M. The price bid shall be a Unit price per LINEAR FOOT of laying length of 12 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

N. The price bid shall be a Unit price per LINEAR FOOT of laying length of 18 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

O. The price bid shall be a Unit price per LINEAR FOOT of laying length of 24 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

P. The price bid shall be a Unit price per LINEAR FOOT of laying length of 30 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

Q. The price bid shall be a Unit price per LINEAR FOOT of laying length of 36 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

R. The price bid shall be a Unit price per LINEAR FOOT of laying length of 48 INCH DIAMETER OF PERFORATED HDPE PIPE as shown in the Contract Drawings.

S. The price bid shall be a Unit price per LINEAR FOOT of 6 INCH DIAMETER OF PVC PIPE as shown in the Contract Drawings.

T. The price bid shall be a Unit price per LINEAR FOOT of 8 INCH DIAMETER OF PVC PIPE as shown in the Contract Drawings.

U. The price bid shall be a Unit price per LINEAR FOOT of 10 INCH DIAMETER OF PVC PIPE as shown in the Contract Drawings.

V. The price bid shall be a Unit price per INLINE CHECK VALVE of each size shown in the Contract Drawings.

W. The price bid shall be a Unit price per LINEAR FOOT of 6 INCH DIAMETER OF PERFORATED PVC PIPE as shown in the Contract Drawings.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Pipe must conform to the latest standards of the American National Standards Institute ("ANSI"), the American Society for Testing and Materials ("ASTM"), the American Water Works Association ("AWWA") and the National Sanitation Foundation ("NSF").

B. HDPE pipe and fittings must conform to the following ASTM and AASHTO standards:

1. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

2. ASTM D3350 – Standard Specification for Polyethylene Plastic Pipe and Fittings Materials

3. AASHTO M 252 –Standard Specification for Corrugated Polyethylene Drainage Pipe

4. ASTM D1248 – Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

5. ASTM D7001 – Standard Specification for Geocomposites for Pavement Edge Drains and other High-Flow Applications

6. ASTM D2321 – Standard Practice for Underground Installations of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

C. PVC pipe, gasket, and fittings must conform to the following ASTM and AASHTO standards:

1. ASTM D3034 –Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

2. ASTM D1784 – Standard Specification for Rigid PVC Compounds and CPVC Compounds

3. ASTM D2412 – Standard Test Method for Determination of External Loading

4. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

5. ASTM D2321 – Standard Practice for Underground Installations of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

6. ASTM D2152 – Standard Test Method for Adequacy of Fusion of Extruded PVC Pipe and Molded Fittings by Acetone Immersion

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor shall submit catalog data for pipe, couplings, and other appurtenances in accordance with the requirements of DEP Standard Specifications for Green Infrastructure Section 01 33 00 – Submittal Procedures. The data submitted shall include, where applicable, manufacturer's descriptive literature and installation instructions.

B. Inline Check Valve

1. The Contractor shall submit Shop Drawings and reference materials for the approval of the Engineer. Submittals shall include, but not be limited to:

   a. Shop drawings

   b. Product literature including installation and maintenance recommendations.

   c. Technical Specifications including head loss, flow data, pressure ratings, vertical and horizontal opening pressures.

1.07 QUALITY CONTROL (NOT USED)

CONTRACT GI-CONS-7
SECTION 33 42 11
STORMWATER GRAVITY PIPING

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. HDPE Perforated and/or Solid Pipe

1. Advanced Drainage Systems, Inc. ("ADS") – Hilliard, OH 43026

2. Hancor, Inc. – Findlay, OH 45840

3. Or Approved Equal

B. PVC Perforated and/or Solid Pipe

1. Advanced Drainage Systems, Inc. ("ADS") – Hilliard, OH 43026

2. Hancor, Inc. – Findlay, OH 45840

3. Royal Municipal Solutions – Woodbridge, ON L4L 8P3

4. National Pipe & Plastics, Inc. – Vestal, NY 13850

5. Or Approved Equal

C. Inline Check Valve

1. WAPRO – Chicago, IL 60601

2. or Approved Equal

2.02 CHEMICAL AND PHYSICAL REQUIREMENTS

A. The pipe must be as uniform as commercially practicable in color, capacity, density and other physical properties.

B. The pipe must contain no recycled materials or compounds.

C. Visible defects, such as cracks, creases, crazing, non-uniformly pigmented areas or undispersed raw materials will not be acceptable and will result in rejection of the pipe by the Engineer.

D. Pipe fittings must be manufactured to the requirements of ASTM D 3212 and this Specification. Fabricated fittings must be pressure rated to match the system piping.

E. HDPE Perforated and/or Solid Pipe

1. HDPE pipe must be manufactured from high density polyethylene resin in accordance with ASTM D3350 and PPI TR4. The pipe shall conform to cell classification PE 424420C for PE42 under ASTM D-3350. The pipe material must conform to the following cell classification requirements:

Property	Value	ASTM Test Procedure Designation
Density	0.955 gm/cm^3	D 1505
Melt Flow Index	1.0	D 1238
Flexural Modulus	80,000 psi	D 790
Tensile Strength @ Yield	3,200 psi	D 638
ESCR	Max Failure = 50%	D1693
Hydraulic Design Basis	Not Pressure Rated	D 2837
UV Stabilizer	C, Black with 2-3% carbon black	D 3350

2. HDPE pipe must be marked either continuously or on intervals not to exceed five (5) feet by indirect printing with the following information:

   a. Name and/or trademark of the manufacturer.

   b. Nominal pipe size.

   c. Dimension Ratio ("DR").

   d. The letters PE followed by the polyethylene grade per ASTM D-1248, followed by the Hydrostatic Design Basis.

   e. Manufacturing Standard Reference.

   f. Production Code from which time and date of manufacture can be determined.

F. PVC Perforated and/or Solid Pipe

1. PVC pipe must be manufactured from high density polyvinyl chloride in accordance with ASTM D1784. The pipe must conform to cell classification 12354 under ASTM D1784. Pipes that conform to a different cell classification because one or more properties are superior to those of the specified classification are also acceptable. The pipe material must conform to the following cell classification requirements:

Property	Value	ASTM Test Procedure Designation
Base Resin	PVC homopolymer	D 4216
Notched Izod	0.65 ft-lb/in	D 256
Tensile Strength	5,000 psi	D 638
Tensile Modulus	400,000 psi	D 638
DTUL @ 264 psi	154° F	D 648

2. PVC pipe must be marked either continuously or on intervals not to exceed five (5) feet by indirect printing as specified in ASTM D1785

   a. Name and/or trademark of the manufacturer.

   b. Nominal pipe size.

   c. Material designation code.

   d. Dimension Ratio ("DR").

   e. Manufacturing Standard Reference.

   f. Production Code from which time and date of manufacture can be determined.

G. Inline Check Valve

1. Standard materials of construction:

   a. Pipe: Stainless Steel AISI 316

   b. Membrane: Polyurethane (PU)

   c. Sealing/Gasket: EPDM

2. Inline check valve's diameter will be as shown on the Contract Drawings.

3. The inline check valve membrane shall be mounted in a stainless-steel housing that, during installation, is to be inserted as-is on site into an existing pipe.

4. Inline check valve will only allow flow in the direction shown on the Contract Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Utilize utmost care when lowering unit into the trench. Handle using nylon slings and two (2) pick points.

B. When the unit consists of two (2) sections, place the downstream section first. Properly lube the bell and spigot to connect and home the remaining section.

C. 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. During construction, keep the lines free from foreign matter. The piping must be left thoroughly clean to the satisfaction of the Engineer.

E. All connections to stormwater manholes, stormwater inlets, junctions, and/or inlets should be grouted and water/soil tight.

F. Use reducing fittings for all changes in pipe size. Do not use bushings.

G. Inline check valve installation shall be conducted according to the manufacturer's written instructions. All valves shall be marked with a unique serial number and flow direction reference.

3.02 LEAKAGE TESTS

A. All pipes shall be flushed and cleaned after installation. Pipes shall be tested for leaks in accordance with Section 33 01 12.11 - Leakage Detection.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 44 31
STORMWATER MEMBRANE FILTRATION

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall furnish and install either woven or nonwoven geotextile – drainage or stabilization/separation as shown on the Contract Drawings and as directed by the Engineer. Drainage application is defined as a soil to geotextile system that allows for long-term, adequate liquid flow normal to the geotextile with limited soil loss across the plane of the geotextile.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedure

1.03 PAYMENT

A. Measurement and payment shall be made per unit prices as indicated in the Contract Documents and shall include the cost of all labor, materials, and equipment necessary to furnish geotextile in accordance with the plans and specifications, and to the satisfaction of the Engineer .

B. The price bid shall be a unit price per SQUARE YARD of GEOTEXTILE – DRAINAGE, either woven or non-woven.

C. The price bid shall be a unit price per SQUARE YARD of GEOTEXTILE – SEPARATION/STABILIZATION, either woven or non-woven.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. NYCDOT Standard Highway Specifications Subsection 1.06.31, Approval of Materials

B. ASTM D4595 – Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

C. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

D. ASTM D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles

E. ASTM D6241 – Standard Test Method for Measuring Static Puncture Strength of Geotextile and geosynthetic-Related Products Using a 50 mm Probe

F. ASTM D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity

G. ASTM D4751 – Standard Test Methods for Determining Apparent Opening Size of a Geotextile

H. AASHTO-M-288 - Standard Specification for Geosynthetic Specification for Highway Applications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. All submittals must be submitted prior to purchase by the Contractor and shall be made in accordance with the requirements of the NYCDOT Standard Highway Specifications, General Conditions, Subsection 1.06.31, including:

1. Manufacturer's literature including physical, mechanical and chemical properties of the geotextile.

2. Certification of geotextile's minimum average roll values and tests used to determine those properties.

3. Certification of Compliance stating that the geotextile conforms to the Specifications and the manufacturer is aware of and agrees with its intended use.

4. Geotextile manufacturer's qualifications: ISO 9002 certified.

5. Manufacturing quality control test results on geotextiles.

B. Samples: The Contractor shall furnish two (2) labeled samples of the geotextiles intended for use in the Work for approval and the Engineer's use. The label must include the manufacturer's product name, the type of fabric, intended use, and the weight of grade of the material. Geotextiles used in the Work shall conform to the approved samples.

1.07 QUALITY CONTROL

A. Manufacturing Quality Control:

1. Testing must be performed at a laboratory accredited by GAI-LAP for tests required for the geotextile, at frequency exceeding that specified in ASTM D 4354, with following minimum acceptable testing frequency:

Property	Test Method	Test Frequency sq m (sq ft)
Grab Tensile Strength	ASTM D4632	1/10,000 (100,000)
Grab Elongation	ASTM D4632	1/10,000 (100,000)
Trapezoidal Tear	ASTM D4533	1/10,000 (100,000)

B. Conformance Testing:

1. Upon delivery to the Site, Engineer will remove samples of geotextile and send to laboratory for testing.

2. Testing will be performed at a laboratory accredited by GAI-LAP in accordance with ASTM D4759, Practice A.

1.08 DELIVERY, STORAGE AND HANDLING

A. Wrap geotextile in black protective wrap.

B. The geotextile rolls shall be labeled as per ASTM D4873.

C. Deliver, store and handle rolls in a manner to prevent damage.

1. After unloading, inspect rolls for defects and damage.

2. Do not leave covered rolls exposed to elements for more than thirty (30) days unless additional heavy-duty waterproof cover is provided. The geotextile must not be exposed to ultraviolet light for a period exceeding fourteen (14) days.

3. Store rolls off ground, protected from precipitation, ultraviolet radiation, strong chemicals, sparks and flames, temperatures in excess of seventy-one (71) degrees C (160 degrees F) and other environmental conditions that could cause damage to geotextile.

4. Prevent damage to wrappings and geotextile

CONTRACT GI-CONS-7
SECTION 33 44 31
STORMWATER MEMBRANE FILTRATION

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable geotextiles manufacturers for Use in Green Infrastructure are:

1. Advanced Drainage Systems, Inc., Hillard, OH;
2. Carthage Mills, Cincinnati, OH;
3. Mirafi, Inc., Charlotte, NC;
4. Or Approved Equal.

B. Acceptable geotextiles manufacturers for Use in Drinking Fountains are:

1. Carthage Mills, Cincinnati, OH;
2. Mirafi, Inc., Charlotte, NC;
3. Hanes Geo Components, Edison, NJ;
4. Or Approved Equal.

C. Acceptable geotextiles manufacturers for Use in Pavers are:

1. Carthage Mills, Cincinnati, OH;
2. Mirafi, Inc., Charlotte, NC;
3. Boom Environmental Products, New Bedford, MA;
4. Or Approved Equal.

D. Acceptable geotextiles manufacturers for Use in Synthetic Grass are:

1. Carthage Mills, Cincinnati, OH;
2. TenCate, Pendergrass, GA;
3. Boom Environmental Products, New Bedford, MA;
4. Or Approved Equal.

E. Acceptable geotextiles manufacturers for Use in a Drywell are:

1. Advanced Drainage Systems, Inc., Hillard, OH;
2. Carthage Mills, Cincinnati, OH;
3. Mirafi, Inc., Charlotte, NC;
4. Or Approved Equal.

2.02 GEOTEXTILE FOR USE IN GREEN INFRASTRUCTURE

A. Fibers used in the manufacture of drainage geotextiles, and the threads used in joining geotextiles by sewing, must consist of long-chain, synthetic polymers, composed of at least ninety-five (95%) percent by weight polyolefins, polyesters, or polyamides. The fibers must be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

B. The geotextile must have no tears or defects which adversely alter its physical properties.

C. Geotextiles used in drainage applications must conform to the following properties for Non-Woven Geotextile Drainage:

Property	**ASTM Test**	**Requirements**
Structure		Non-Woven
Elongation	ASTM D4595	≥ 50%
Grab Strength (Min.)	ASTM D4632	700N (157 LBS)
Tear Strength (Min.)	ASTM D4533	250N (56 LBS)
CBR Puncture (Min.)	ASTM D6241	310 LBS
Permittivity (Min.)	ASTM D4491	0.21 / sec.
Apparent Opening Size (Max.)	ASTM D4751	0.25 mm (0.0098 inch) Std. No. 60 sieve

D. Geotextiles used in drainage applications must conform to the following properties for Woven Geotextile Drainage:

Property	**ASTM Test**	**Requirements**
Structure		Woven
Elongation	ASTM D4595	≥ 15%
Grab Strength (Min.)	ASTM D4632	1400N (315 LBS)
Tear Strength (Min.)	ASTM D4533	533N (120 LBS)
CBR Puncture (Min.)	ASTM D6241	667N (150 LBS)
Permittivity (Min.)	ASTM D4491	0.05 / sec.
Apparent Opening Size (Max.)	ASTM D4751	0.425 mm (0.0167 inch) Std. No. 40 sieve

2.03 GEOTEXTILE FOR USE IN DRINKING FOUNTAINS

A. Geotextile shall be FX-60HS (nonwoven) as manufactured by Carthage Mills, Cincinnati, OH, or 160N (nonwoven) by Mirafi, Inc., Charlotte, NC, or TerraTex N06 (nonwoven) by Hanes Geo Components, Edison, NJ, or approved equal.

2.04 GEOTEXTILE FOR USE IN PAVERS

A. Geotextile shall be synthetic, nonwoven and rotproof having no tears or defects which adversely alter its physical properties. Geotextile used shall conform to the following properties:

Property	**ASTM Test**	**Requirements**
Structure		Non-Woven
Elongation	ASTM D4632	= 50%
Grab Strength (Min.)	ASTM D4632	400N (90 LBS)
Tear Strength (Min.)	ASTM D4533	250N (56 LBS)
CBR Puncture (Min.)	ASTM D6241	250 LBS
Permittivity (Min.)	ASTM D4491	0.21 / sec.
Apparent Opening Size (Max.)	ASTM D4751	0.25 mm (0.0098 inch) Std. No. 60 sieve

B. Geotextile shall be similar to FX-50HS by Carthage Mills, Cincinnati, OH; 160N, as manufactured by Mirafi, Charlotte, NC; AEF 880, as manufactured by Boom Environmental Products, New Bedford, MA, or approved equal.

2.05 GEOTEXTILE FOR USE IN SYNTHETIC GRASS

A. Geotextile shall be a nonwoven, rotproof, heavy weight synthetic geotextile necessary to provide reinforcement, separation of the base aggregate and subgrade soils, and filtration of water from the base aggregate to the subgrade soils. Geotextile used shall conform to the following properties:

Property	**ASTM Test**	**Requirements**
Elongation	D4595	>50%
Grab Strength (min)	D4632	665 N (150 lbs)
Tear Strength (min)	D4533	270 N (60 lbs)
CBR Puncture (min)	D6241	310 lbs
Permittivity (min)	D4491	1.3/sec
Apparent Opening Size (max)	D4751	0.212 mm (0.0083 in) Std. No. 70 sieve

B. Nonwoven geotextile shall be Mirafi 160N, as manufactured by TenCate, Pendergrass, GA; AEF 880, as manufactured by BOOM Environmental Products, New Bedford, MA; FX-60HS manufactured by Carthage Mills, Cincinnati, OH or approved equal.

2.06 GEOTEXTILE FOR USE IN ASPHALT PAVING

C. Geotextile: Provide geotextile fabric conforming to the requirements specified in this section:

1. Woven slit film polypropylene geotextile; individual slit films woven together in manner to provide dimensional stability relative to each other.

2. Resistant to ultraviolet degradation and biological and chemical environments normally found in soils.

3. Minimum Average Roll Values:

Property	Test Method	Units	Results
Grab Tensile Strength	ASTM D4632	kN (lbs)	1.40 (315)
Grab Tensile Elongation	ASTM D4632	Percent	15 x 15
CBR Puncture	ASTM D6241	kN (lbs)	4.44 (900)
Trapezoidal Tear	ASTM D4533	kN (lbs)	0.533 (120)
Apparent Opening Size	ASTM D4751	mm	0.425
Permittivity	ASTM D4491	sec-1	0.05
Water Flow Rate	ASTM D4491	$1/min/m^2$ (gpm/ft^2)	163 (4)
UV Resistance (percent retained at 500 hours)	ASTM D4355	Percent	70

2.07 GEOTEXTILE FOR USE IN POROUS ASPHALT

A. Geotextile: Provide geotextile fabric conforming to the requirements specified in this section:

Mechanical	Test Method	Unit	Minimum Average Roll Values	
			MD*	CD**
Grab Tensile Strength	ASTM D 4632	kN (lbs)	0.71 (160)	0.71 (160)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Shear Strength	ASTM D 4533	kN (lbs)	0.27 (60)	0.27 (60)
CBR Puncture	ASTM D 6241	kN (lbs)	0.42 (95)	0.42 (95)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2100 (305)	2100 (305)
Apparent Opening Size (AOS)	ASTM D 4751	mm (US Sieve)	0.212 (70)	0.212 (70)

Permittivity	ASTM D 4491	sec-1	1.4	1.4
Permeability	ASTM D 4491	cm/sec	0.22	0.22
Flow Rate	ASTM D 4491	lpm/m^2 (gpm/ft^2)	4,477 (110)	4,477 (110)
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	70

Physical Properties	**Test Method**	**Unit**	**Typical Value**
Weight	ASTM D 5261	g/m^2 (oz/yd^2)	217 (6.4)
Thickness	ASTM D 5199	mm (mils)	1.9 (75)
Roll dimension (width x length)		m (ft)	4.5 x 91 (15 x 300)
Roll Area		m2 (yd2)	410 (500)
Estimated roll weight		kg (lb)	99 (217)

*MD - Machine Direction; **CD - Cross-machine Direction

2.08 GEOTEXTILE FOR USE IN A DRYWELL

A. Geotextiles used in drywell drainage applications shall be Class 2 and shall conform to AASHTO-M-288 properties for drainage geotextiles.

2.09 GEOTEXTILE FOR USE IN SEPARATION/STABILIZATION

A. Geotextile - Separation: Separation application is defined as the placement of a flexible porous geotextile between dissimilar materials so that the integrity and functioning of both materials can be maintained or improved, but where water seepage through the geotextile is not a critical function.

Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain, synthetic polymers, composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The geotextile and the threads used in sewing geotextiles, shall be resistant to chemical attack, rot, and mildew. The geotextile shall have no tears or defects which adversely alter its physical properties. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

Property	**ASTM Test**		

Structure	N/A	Woven	Non-Woven
Elongation	D4632	<50%	>=50%
Grab Strength (min)	D4632	1100N (247LBF)	700N (157LBF)
Tear Strength (min)	D4533	400N (90LBF)	250N (56LBF)
CBR Puncture	D6241	4000N (90LBF)	1820N (410LBF)
Permittivity (min)	D4491	0.02/sec	0.02/sec
Apparent Opening (max)	D4751	0.6 mm	0.6 mm

Geotextile shall be ADS 315W, as manufactured by Advanced Drainage Systems, Inc., Hillard, OH; FX-66 (woven) or FX-60HS (non-woven) as manufactured by Carthage Mills, Cincinnati, OH; or 600X (woven) or 160N (non-woven) as manufactured by Mirafi, Inc., Pendergrass, NC, or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Prior to installation of geotextile, the ground must be prepared by removing stumps and other organic material, along with any large boulders and sharp objects which may tear or damage the fabric.

B. Install geotextile at elevations and alignments as indicated on the Contract Drawings or as directed by the Engineer. The drainage geotextile must be placed loosely with no wrinkles or folds. Care will be taken to place the geotextile in intimate contact with the soil so that no void spaces occur between the geotextile and trench or ground. Where the geotextile is to be installed in a trench, the geotextile must be overlapped at the top of the trench, twelve (12) inches or the full width of the trench, whichever is less.

C. If the geotextile is damaged during installation, the rupture must be removed and the damaged area must be covered with a patch of new fabric which will overlap the undamaged fabric at least six (6) inches in all directions. There shall be no additional

payment for any such repairs. All repaired fabric surface costs will be deemed part of the price bid.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 46 16
OUTLET CONTROL STRUCTURES

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide Outlet Control Structures constructed of the sizes, classes and kinds shown, specified or required.

B. Outlet Control Structures include:

1. Outlet Control Structure with Ductile Iron Pipe (DIP) and Cap

2. Outlet Control Structure with Reentrant Orifice Tube

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00 – Submittal Procedures
B. Section 03 10 00 – Concrete Forming and Accessories
C. Section 03 32 00 – Joints in Concrete
D. Section 03 21 00 – Reinforcing Steel
E. Section 03 30 00 – Cast-in-Place Concrete
F. Section 03 35 00 – Concrete Finishing
G. Section 03 45 00 – Precast Structural Concrete
H. Section 03 60 00 – Grouting
I. Section 04 05 00 – Common Work results for Masonry
J. Section 31 23 16 – Excavation
K. Section 31 05 16 – Aggregates for Earthwork
L. Section 33 01 12.11 – Leakage Detection
M. Section 32 12 16 – Asphalt Paving
N. Section 33 05 19 – Ductile Iron Utility Pipe
O. Section 33 39 10 – Sanitary and Storm Sewer Structures
P. Section 33 42 11 – Stormwater Gravity Piping

CONTRACT GI-CONS-7
SECTION 33 46 16
OUTLET CONTROL STRUCTURES

1.03 PAYMENT

A. The price bid shall be a Unit price for EACH Outlet Control Structure of each type shall include the cost of all labor, materials, and equipment necessary to furnish and place concrete, including foundation material, steel bars, expansion joints material, formwork, cast iron frame and cover, plastic steps, brick, curb piece, bituminous coating, low flow orifice, ductile iron pipe, cap and fittings, and other incidental work and expenses necessary to complete the work in accordance with the plans and specifications of the Engineer. Outlet Control Structure types are as follows:

1. Type 1: Outlet Control Structure with Ductile Iron Pipe and Cap

2. Type 2: Outlet Control Structure with Reentrant Orifice Tube

1.04 REFERENCE CODES AND STANDARDS

A. DEP BWSO Standard Sewer and Water Main Specifications

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. Prior to installation of structures the Contractor will be required to submit three (3) copies of the shop drawings to the Engineer for review. These sheets shall note all pipe entries, final grades, etc. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each outlet control structure with regard to details, contract plans, standards and specifications.

B. The Contractor shall submit working drawings as specified in Section 01 33 00 – Submittal Procedures.

1.07 QUALITY CONTROL (NOT USED)

PART 2 PRODUCTS

2.01 GENERAL

2.02 Contractor may seek permission to substitute, in lieu of precast Outlet Control Structures, cast-in-place Reinforced Concrete Outlet Control Structures at the same Unit bid price. The Contractor will be required to submit three (3) copies of the manufacturer’s shop drawings for review. These sheets shall note all pipe entries, final grades, rebar, etc. The Engineer's review of such submissions shall in no way absolve the Contractor from full responsibility as to the correctness of each outlet control structures with regard to details, contract plans, standards and specifications.

Precast and poured-in-place Outlet Control Structures shall meet NYC DEP requirements and be capable of withstanding an AASHTO HS-20 loading.

2.03 MANUFACTURERS

A. Mechanical joint fittings shall be as manufactured by American Cast Iron Pipe Company or an approved equal.

B. Mechanical joint caps shall be as manufactured by American Cast Iron Pipe Company or an approved equal.

C. Mechanical joint plugs shall be as manufactured by American Cast Iron Pipe Company or an approved equal.

2.04 MATERIALS

A. Concrete shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete and below:

1. For precast reinforced concrete outlet control structures, concrete shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete, except that the concrete shall have a concrete design mix for five thousand (5,000) pounds per square inch. The maximum allowable chloride content in the concrete shall not exceed one- tenth (1/10) of one percent by weight of cement. The maximum water/cement ratio shall not exceed forty-seven (47) percent by weight.

B. Brick and brick masonry shall comply with the requirements of Section 04 05 00 – Common Work Results for Masonry.

C. Frames and covers shall be of cast iron, unless otherwise shown on the contract plans, complying with the requirements of Section 22.01of DEP's Standard Sewer and Water Main Specifications (July 2014 or latest version), Type 1. Malleable iron or cast steel covers, when required, shall comply with the requirements of Section 33 39 10 – Sanitary and Storm Sewer Structures.

D. Steps shall be copolymer polypropylene plastic per DEP Sewer Design Standard Detail SE46.

E. Cement mortar shall comply with the requirements of Section 04 05 00 – Common Work Results for Masonry.

F. Reinforcement shall comply with the requirements of Section 03 21 00 – Reinforcing Steel.

G. Ductile iron pipe, cap and fittings for low flow orifice shall comply with the requirements of DEP Standard Specifications for On-Site Green Infrastructure Section 33 05 19 – Ductile Iron Utility Piping.

H. Portland Cement shall comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete, and shall be Type II unless otherwise specified. Coarse and Fine Aggregate for concrete shall be well graded in accordance with Section 03 30 00 – Cast-in-Place Concrete. Size of Coarse Aggregate shall be three-quarter (3/4) inch unless smaller size aggregate is required due to nature of work.

I. High range water reducing admixtures meeting the requirements of ASTM C494 Type F and having been previously approved by the New York State Department of Transportation may be used.

J. Cement grout will comply with the requirements of Section 03 60 00 –Grouting.

K. Concrete for cradle and encasement will comply with the requirements of Section 03 30 00 – Cast-in-Place Concrete.

I. Mechanical joint and cap fitting shall be ductile iron.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS FOR OUTLET CONTROL STRUCTURES

A. Outlet Control Structures shall be constructed per the construction documents to the dimensions and the elevations shown on the plans or as directed by the Engineer.

B. The minimum dimensions, minimum reinforcement and minimum requirements utilized for the construction of reinforced concrete outlet control structures shall conform to the contract drawings.

C. Low flow orifice configuration inclusive of ductile iron pipe, cap, fittings, and wall connection shall be watertight upon installation.

3.02 GENERAL CONSTRUCTION PROVISIONS FOR OUTLET CONTROL STRUCTURES

A. The requirements of DEP Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications Division IV – General Construction Provisions shall apply to the work to be done hereunder.

3.03 GENERAL REQUIREMENTS FOR OUTLET CONTROL STRUCTURE CONNECTIONS

A. All pipe openings shall conform to the sizes, dimensions and requirements specified on the contract drawings or as directed by the engineer.

B. All pipe openings shall be provided with two (2) number four (4) reinforcement bar hoops around each opening and each opening shall be provided for at the time of manufacture.

C. Openings installed in the field shall be as indicated on the Contract Drawings. The Engineer must approve coring machines and coring methods.

D. Pipe openings will not be permitted through joints. The distance from the top or bottom of any section to the opening shall be a minimum of three (3) inches plus the joint depth for cast pipe openings and a minimum of twelve (12) inches plus the joint depth for cored openings for basin connections.

3.04 GENERAL CONSTRUCTION PROVISIONS FOR OUTLET CONTROL STRUCTURE CONNECTIONS

A. During the progress of the Work the exposed ends of pipe sewers must be provided with approved temporary covers fitted to the pipe so as to exclude earth and other materials.

B. The ends of the pipe that enter masonry walls must be cut to fit the inner face of the masonry. Unless otherwise directed, such cutting must be done before the pipes are built in.

C. DAMAGED PIPE - Pipe damaged from handling or during drainage inlet construction, must be replaced and removed from the site of the Work by and at the sole expense of the Contractor.

D. CONNECTIONS TO STRUCTURES - Where openings are not provided in manholes and chambers for connection of drainage pipe connections, the Contractor shall core openings in the walls of the manholes and chambers for manhole connections as directed by the Engineer. The maximum diameter of the cored opening for manhole connections will be sixteen inches. The use of pneumatic percussion hammers will not be permitted in order to provide an opening for manhole connections.

E. SETTING FRAME - Frames shall be adjusted to the final grades by the use of cement mortar or by brick masonry set in cement mortar as directed by the Engineer.

F. CONTRACT DRAWINGS - The Contract Drawings are diagrammatic but shall be followed as closely as conditions at the site of work or the other trades will permit. As the work progresses, these drawings may be revised or supplemented by the Engineer, to illustrate the work further, and the Contractor shall perform the work required by such revisions or supplements without additional compensation unless the Engineer determines that any such changes warrant additional compensation.

3.05 GENERAL CONSTRUCTION PROVISIONS FOR PRE-CAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

A. JOINTS AND GASKETS - Each section of precast reinforced concrete outlet control structure shall be provided with lap and spigot joints that will permit water tight and permanent joints. The minimum lap shall be that shown on the standard details. Gaskets shall be provided at all joints and shall be either 7/8" x 7/8" or 1" diameter Self Sealing Butyl Gasket (quality equal to Federal Specification No. SS-S-00210) or "0" Ring Gaskets with the size as specified on the standards drawings. "0" Ring Gaskets shall meet the following requirements.

1. For Type 4 Joint (Ring Rubber Gasket of Circular Cross Section and Grooved Spigot Joint), the thickness of the pipe at the root of the bell or socket shall not be less than one-half (1/2) the thickness of the pipe barrel. The length of the spigot and the depth of the bell or socket shall be equal and shall be a minimum of three (3) inches. The conic surfaces of the inside of the bell or socket and the outer surface of the spigot shall be parallel and the angle of taper on these conic surfaces

with respect to the longitudinal axis of the pipe shall not exceed two (2) degrees. The spigot end of the pipe shall be grooved a minimum distance of three-quarter (3/4) inch from the end of the spigot to the edge of the groove. The dimensions of the groove shall be such that the area of the groove plus the annular space immediately adjacent to the groove shall be ten (10) percent to fifteen (15) percent smaller than the area of the ring gasket when the gasket is in position in the groove prior to the joining of the pipe sections.

3.06 CONCRETE OUTLET CONTROL STRUCTURE CONSTRUCTION

A. Concrete outlet control structures shall be built of the sizes and dimensions, and of the types, shown on the plans or as directed by the Engineer. The following shall apply:

1. Inverts of outlet control structures shall be formed between transverse templates and shall be screeded. Where the radii of inverts are too small to permit screeding between templates, the inverts shall be shaped by means of interior forms. The concrete for inverts shall be deposited continuously for their entire cross section and length of outlet control structures. Inverts shall be carefully protected from all injury during the progress of the work. The inverts of outlet control structures shall be troweled smooth.

2. Concrete in sidewalls of shall be deposited continuously to the height and to the thickness approved and for their entire length.

3. Concrete in roofs of shall be deposited continuously for the full depths, and for the entire widths and lengths of the roofs. The outer surfaces of roofs shall be finished true and smooth.

B. STEPS AND LADDERS - The Contractor shall furnish and install in the outlet control structures, steps and ladders of the size, shape, material and spacing shown on the contract drawings. Steps and ladders or other step or ladder hardware shall be placed integrally with the concrete or shall be installed by drilling a core hole and either installing a thermoplastic insert or expansion anchor to accept hardware, or setting hardware into nonshrink fresh grout or an approved nonshrink compound.

C. SETTING FRAMES AND COVERS - The brick masonry or concrete for the outlet control structures shall be built to within such distance of the final grade as shown, specified or ordered. Frames and covers shall be as shown on the Sewer Design Standards. The frames shall be set on the masonry or concrete in a full bed of stiff fresh cement mortar.

D. REMOVAL OF FORMS - Forms shall be removed in accordance with Section 03 10 00 – Concrete Forming and Accessories.

E. REINFORCEMENT AND STRUCTURAL STEEL - The steel reinforcement shall be of the dimensions and shapes shown, and installed in the manner specified in Section 03 21 00 – Reinforcing Steel Structural steel shall be of the shapes and sizes shown, and installed as directed.

F. BULKHEADS - Approved construction joint bulkheads with provisions for keying and doweling for future sewers shall be provided, where shown or required.

G. CONNECTIONS - All connections to manholes of existing, new or future sewers and drainage inlet connections shall be constructed as shown on the plans or as directed. All connections for future sewers shall be closed with bulkheads of brick masonry eight (8) inches thick, unless otherwise shown on the plans or specified.

H. WATERSTOPS - Waterstops shall be provided between each successive pour in accordance with Section 25.04 of DEP's Standard Sewer and Water Main Specifications (July 2014 or latest version).

3.07 MANUFACTURE OF PRECAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

A. Precast outlet control structures shall be built in conformance with the contract drawings and shall be cast in steel forms.

B. Devices used to position reinforcement shall be made of, or coated with, material so that corrosion of the device will not occur. Sufficient devices shall be provided to position the reinforcement for required concrete cover.

C. Concrete shall be thoroughly consolidated by internal or external vibration or a combination of both.

3.08 CURING OF PRECAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

A. All precast sections shall be subjected to curing by one of the following methods:

1. STEAM CURING

Sections may be placed in a curing chamber, free from outside drafts, and cured in a moist atmosphere maintained at a temperature between one hundred (100) degrees Fahrenheit and one hundred sixty (160) degrees Fahrenheit, by the injection of steam for a period of not less than twelve (12) hours or, when necessary, for such additional time as may be needed to enable the pipe to meet the strength requirements. Steam curing shall not commence until at least two (2) hours have elapsed since completion of placement of concrete in the forms. When a curing chamber is not available, sections may be placed in an enclosure of canvas and subjected to steam around the entire section at the temperature and for the time specified above. The enclosure shall be so erected as to allow full circulation of steam around the entire section. The interior surface of the curing room or canvas jackets and the surfaces of the section shall be entirely moist at all times.

2. WATER SPRAY CURING

Under the conditions of enclosure described in the above paragraph on "Steam Curing", sections may be cured by subjecting them to a continuous fine spray of water in an enclosure maintained at a temperature of not less than seventy (70) degrees Fahrenheit for a period of not less than seventy-two (72) hours or such additional time as may be necessary to meet the strength requirements.

3. SATURATED COVER CURING

The sides and top of each section shall be covered with heavy burlap or other suitable material saturated with water before applying and kept saturated at a temperature of not less than seventy (70) degrees Fahrenheit for seventy-two (72) hours or such additional time as may be necessary to meet the strength requirements.

B. Precast Sections shall not be subjected to freezing temperatures until the required twenty-eight (28) day compressive strength is achieved.

3.09 INSTALLATION OF PRECAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

All precast Outlet Control Structures shall be installed in accordance with the standards and specifications for Outlet Control Structures and as directed by the Engineer.

3.10 MARKINGS OF PRECAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

A. The manufacturer shall mark each individual piece with permanent markings on the inside of each section. The following minimum information shall be listed:

1. Date of Manufacture

2. Manufacturer's Logo

3. Individual Piece Identification

4. ASTM Designation

3.11 DELIVERY OF SECTIONS OF PRECAST REINFORCED CONCRETE OUTLET CONTROL STRUCTURES

No sections shall be delivered to the job site until they have attained the specified twenty-eight (28) day compressive strength as evidenced by cylinder testing. In addition, five (5) copies of all test results, steel supplier certifications, independent Testing Laboratory certifications, and fabrication and manufacture certifications must be submitted to the Engineer prior to delivery or at the time of delivery.

3.12 TEST AND GUARANTEES

A. Testing and Inspection of the storm system shall be in conformance with New York City Department of Environment Protection, Bureau of Sewers. All tests required by the Engineer shall be made under the supervision of the Engineer.

B. Concrete utilized in the construction of precast or cast-in-place reinforced concrete outlet control structures shall be tested in conformance with Section 03 30 00 Cast-In-Place Concrete or 03 41 00 Precast Structural Concrete.; with the exception that the concrete, steel reinforcement, fabrication and manufacture shall be tested and certified as to

compliance by an independent Testing Laboratory licensed in the State of New York and approved by the Department of Design and Construction.

C. Hydrostatic Tests per Section 33 01 12.11 Leakage Detection, identical to those performed for Reinforced Concrete Pipe, and as defined in these specifications shall be performed and must be satisfactorily completed prior to acceptance.

D. Testing shall also conform to all applicable sections of DEP Bureau of Water and Sewer Operations Standard Sewer and Water Main Specifications DIVISION III - Inspection of Materials, Sampling, and Methods of Test.

E. In addition, all manufacture of sections shall be witnessed by an approved licensed independent Testing Laboratory and Certified as to Compliance with the standard drawings and specifications.

F. The cost of all testing as described above shall be deemed included in the price bid per outlet control structure.

G. When installation of any part thereof is completed and ready for operation, and prior to final payment, inspection and tests may be made by the Engineer of all materials and appliances installed under this Contract. The Contractor shall furnish all materials, instruments, and labor required for such tests. Should inspection and tests show that any material or workmanship are not first class or not in the opinion of the Engineer in accordance with the drawings and specifications, the Contractor, immediately upon receiving written notice, shall remove same and replace with other material in conformity with the specifications at no additional cost to the City.

END OF SECTION

CONTRACT GI-CONS-7
SECTION 33 46 23
MODULAR BURIED STORMWATER STORAGE UNITS

PART 1 GENERAL

1.01 REQUIREMENTS

A. The Contractor shall provide HDPE Stormwater Chambers, constructed of the sizes shown on the plans, all in accordance with the Specifications and standards. The purpose of the HDPE Stormwater Chamber is to provide increased storm runoff retention/detention capacity.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 11 00 – Summary of Work

B. Section 01 33 00 – Submittal Procedures

C. Section 31 23 16 – Excavation

D. Section 31 05 16 – Aggregates for Earthwork

E. Section 31 05 19 – Geosynthetics for Earthwork

F. Section 32 18 13 – Synthetic Grass Surfacing

G. Section 33 05 71 – Cleanouts

H. Section 33 42 11 – Stormwater Gravity Piping

I. Section 33 44 31 – Stormwater Membrane Filtration

J. Section 33 39 10 – Sanitary and Storm Sewer Structures

1.03 PAYMENT

A. The price bid for the SUBSURFACE STORMWATER CHAMBER shall be the unit price per CUBIC FOOT OF CHAMBERS, as shown on the Contract Drawings, and shall include the cost of all labor, materials, equipment, and incidental expenses necessary to complete the Work, including the chambers and connections between chambers within the neat lines shown on the drawings, all in accordance with the plans and Specifications, to the satisfaction of the Engineer.

1.04 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. DEP Standard Designs and Guidelines for Green Infrastructure Practices

1.05 REGULATORY COMPLIANCE (NOT USED)

1.06 SUBMITTALS

A. The Contractor, prior to the start of Work, shall submit to the Engineer for approval catalog samples and cut sheets of the proposed HDPE Stormwater Chambers including certification that materials meet specified requirements and proposed dimensions of the Contract Drawings and DEP Standard Designs and Guidelines for Green Infrastructure Practices.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Site in manufacturer's original, unopened packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in clean, dry area in accordance with manufacturer's instructions.

C. Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.01 Manufacturers

A. CULTEC Inc.
Brookfield, CT 06804

B. StormTech (ADS)
Rocky Hill, CT 06067

C. StormChamber (NDS)
Lindsay, CA 93247

D. Or Approved Equal

E. The stormwater chamber must be manufactured of high molecular weight high density polyethylene in an ISO-9001certified manufacturing facility and meet ASTM D-3350 Cell Class 324420C. Chamber will be manufactured with an open bottom and side walls. If approved by the manufacturer, the units may be trimmed to custom length. The stormwater chamber must conform to the dimensions as shown in the Contract Drawings with placement on bedding and backfill as shown. The minimum acceptable storage volume is 2 cubic feet per linear foot of stormwater chamber.

PART 3 EXECUTION

3.01 INSTALLATION

A. Prior to the installation of the stormwater chamber, the Contractor shall excavate the Green Infrastructure Practice area to the satisfaction of the Engineer. Remove any standing water.

B. Install stone base, stormwater chamber, and select fill as indicated and required by the Contract Documents and manufacturer installation instructions.

END OF SECTION

NEW YORK CITY
ENVIRONMENTAL PROTECTION

INVITATION FOR BIDS

FOR FURNISHING ALL
LABOR AND MATERIAL NECESSARY
AND REQUIRED FOR:

GI-CONS-7

Installation of Green Infrastructure at Seven (7) NYC Parks and Playgrounds

Volume 2 of 2

(Contract Terms, Specifications and Drawings)

JUNE 2026